WHAT YOU SHOULD KNOW
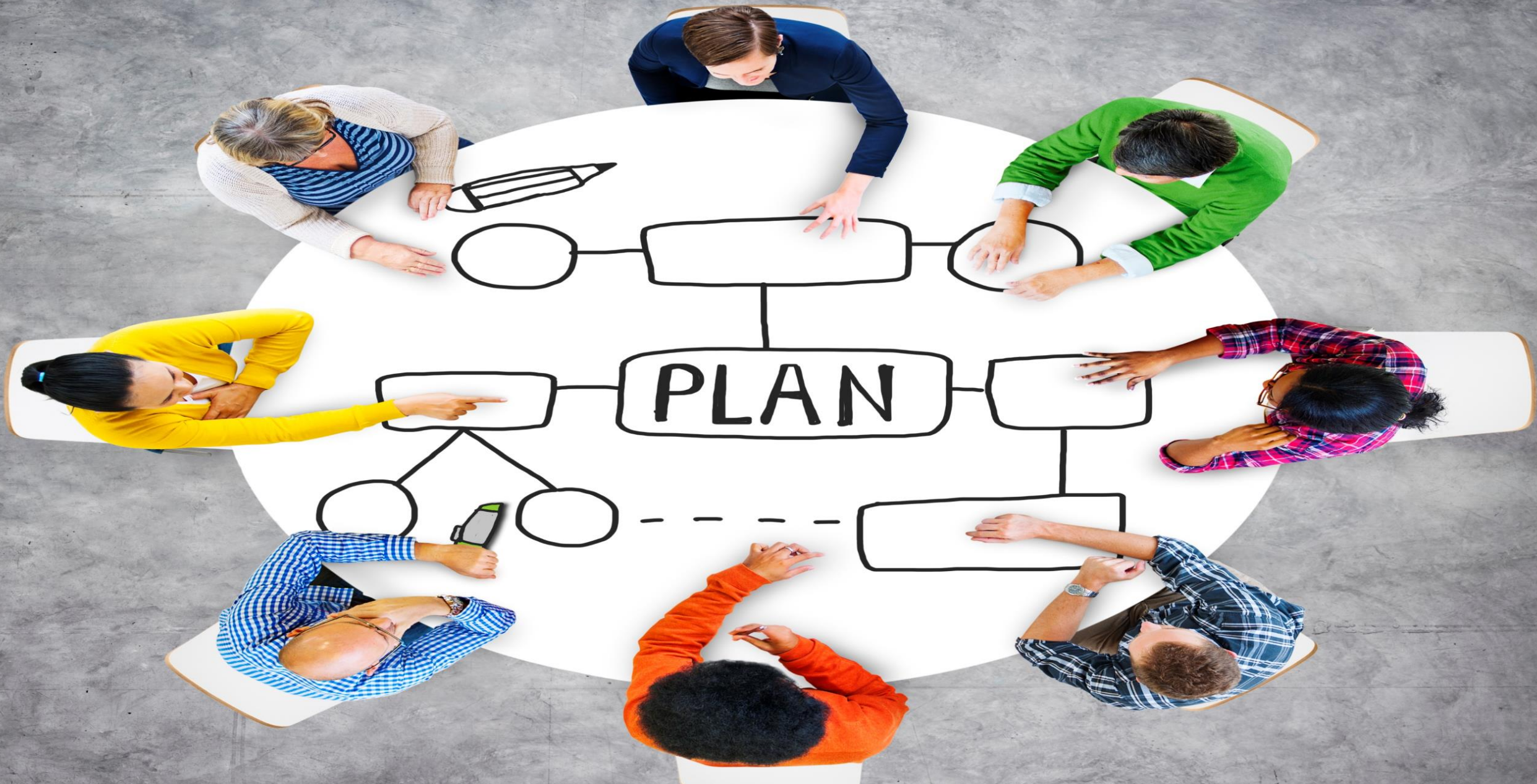
David D. Spaulding, DPS, CIPM

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TIME- vs. MONEY-WEIGHTED PERFORMANCE

YOU SHOULD KNOW THIS!

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TIME- vs. MONEY-WEIGHTED PERFORMANCE

- Time-weighting <u>eliminates</u> or <u>reduces</u> the effect of cash flows, while

- Money-weighting <u>takes cash flows into consideration</u>

TIME- vs. MONEY-WEIGHTED PERFORMANCE

- Time-weighting is ideal to evaluate managers who do not control cash flows, while
- Money-weighting is ideal to evaluate:
  - A client's own or personal return
  - Managers who control cash flows (e.g., private equity)
  - Sub-portfolio returns

WHAT TIME-WEIGHTING ACTUALLY MEANS

WHAT TIME-WEIGHTING ACTUALLY MEANS

- The term was coined by the Bank Administration Institute in their 1968 report, *Measuring the Investment Performance of Pension Funds*

- From the BAI standards:
  - "The recommended rate is called 'time-weighted' because it is simply the weighted average of internal rates of return for the subperiods between cash flows with each weight being only the length of its corresponding subperiod."
  - While this may make intuitive sense, NO ONE DOES THIS! Instead, we use geometric linking

TIME-WEIGHTING HAS COME TO MEAN

Returns that eliminate or reduce the impact of cash flows

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ARITHMETIC vs. GEOMETRIC ATTRIBUTION

ARITHMETIC vs. GEOMETRIC ATTRIBUTION

- It has to do with <u>excess return</u>
- Recall that with attribution, we are trying to *reconcile* to the excess return

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ARITHMETIC vs. GEOMETRIC ATTRIBUTION

- In the case of arithmetic attribution, we are reconciling to an arithmetic view of excess return.
- i.e.,

$$\sum_{i=1}^{n} AE_i = R_P - R_B$$

ARITHMETIC vs. <u>GEOMETRIC</u> ATTRIBUTION

- In the case of geometric attribution, we are reconciling to a geometric view of excess return.
- i.e.,

$$\sum_{i=1}^{n} AE_i = \frac{1 + R_P}{1 + R_B} - 1$$

AN EXAMPLE

Arithmetic:

$$R_P - R_B = 7\% - 5\% = 2\%$$

Geometric:

$$\frac{1 + R_P}{1 + R_B} - 1 = \frac{1 + 7\%}{1 + 5\%} - 1 = \frac{1.07}{1.05} - 1 = 1.9\%$$

ARITHMETIC vs. GEOMETRIC ATTRIBUTION

- Geometric is quite common in the UK, where there seems to be a preference for excess returns to be expressed in a geometric fashion
- The rest of the world prefers arithmetic

SHARPE vs. TREYNOR RATIOS

SHARPE vs. TREYNOR RATIOS

Despite being less popular, Treynor came first

- Treynor, Jack L.. 1965. "How to Rate Management of Investment Funds." *Harvard Business Review*. 43, 63-75.
- Sharpe, William F. 1966. "Mutual Fund Performance." *Journal of Business*. 39, 119.

Editorial comment: Unlikely these publications would be used today for such articles

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SHARPE vs. TREYNOR RATIOS

Both produce what is commonly* referred to as "risk-adjusted returns."

* Though inaccurately, since neither *adjust* returns for risk. Rather, they are ratios that provide the units of return per unit of risk taken

SHARPE vs. TREYNOR RATIOS

Each uses equity risk premium in the numerator, with a risk measure in the denominator

$$TreynorRatio = \frac{\overline{r_p} - \overline{r_f}}{\beta_p}$$

$$SharpeRatio = \frac{\overline{r_p} - \overline{r_f}}{\sigma_p}$$

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CONTRARY TO WHAT CIPM® SAID

- M^2 is NOT tied to Sharpe ratio
- Modigliani's were risk-agnostic
- Can use just about any risk measure (e.g., beta)

BRINSON, HOOD, BEEBOWER vs. BRINSON-FACHLER

BRINSON, HOOD, BEEBOWER vs. BRINSON-FACHLER

Brinson, Hood, Beebower's attribution model was introduced in the *FAJ* :

Brinson, Gary P., L. Randolph Hood, and Gilbert L. Beebower. 1986. "Determinants of Portfolio Performance." *Financial Analysts Journal*: August.

BRINSON, HOOD, BEEBOWER vs. <u>BRINSON-FACHLER</u>

Brinson, Fachler actually preceded BHB, and appeared in *The Journal of Portfolio Management.*

Brinson, Gary P. and Nimrod Fachler. "Measuring Non-U.S. Equity Portfolio Performance." *Journal of Portfolio Management.* Spring 1985.

BRINSON, HOOD, BEEBOWER vs. BRINSON-FACHLER

- Both articles mainly had to do with demonstrating how <u>allocation</u> is an important [and often primary] contributor to returns

- A bi-product was the introduction of two ways to calculate attribution, primarily for equities, though it has other applications

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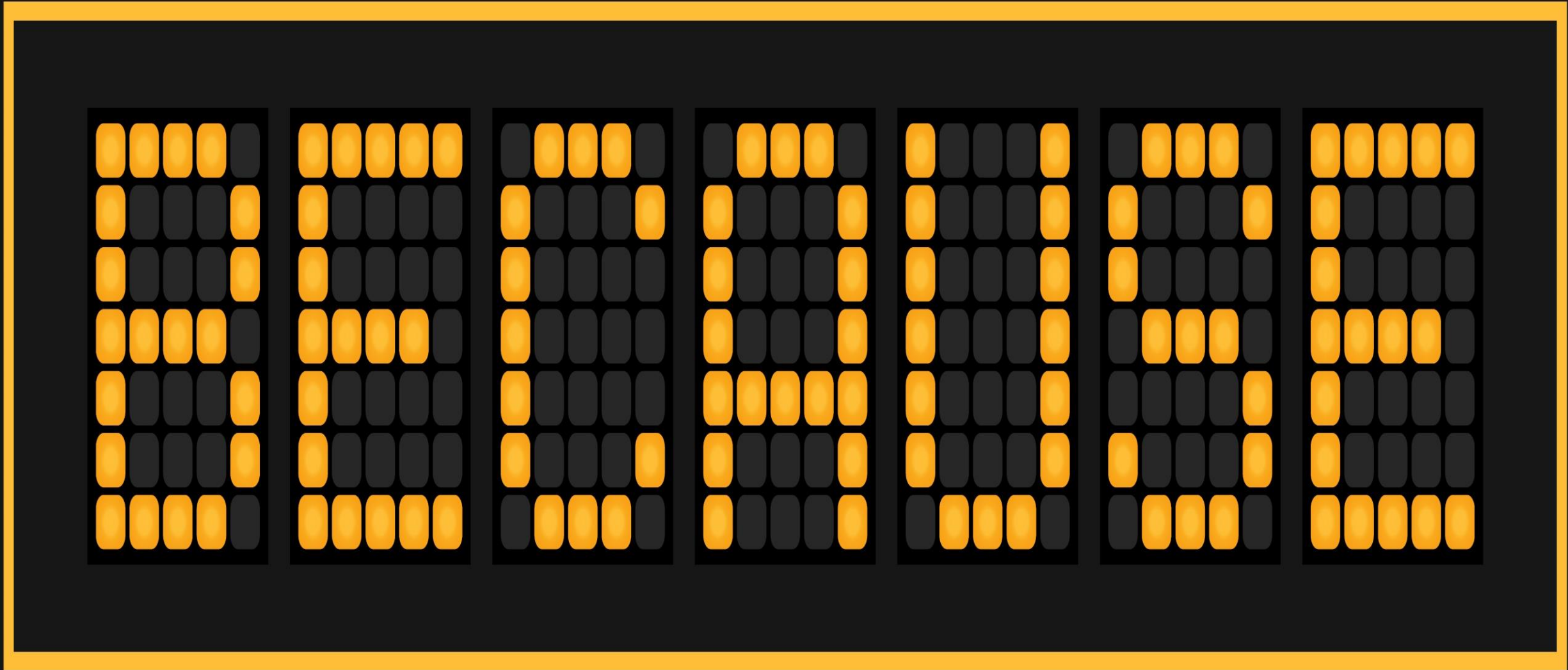
IT HAS TO DO WITH ALLOCATION

The only difference between the models is allocation

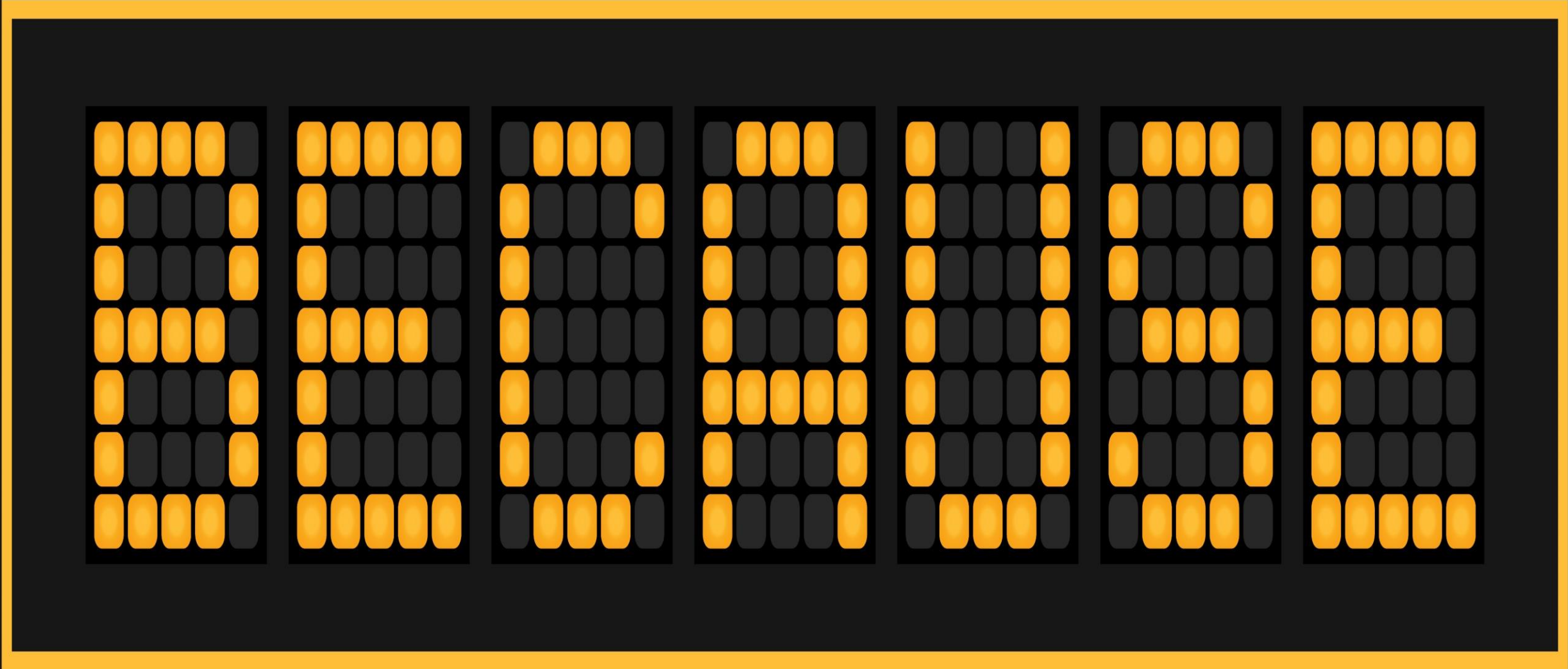$$Allocation_{BHB} = r_{B_i} \times \left(w_{P_i} - w_{B_i} \right)$$

$$Allocation_{BF} = \left(r_{B_i} - R_B \right) \times \left(w_{P_i} - w_{B_i} \right)$$

A WAY TO VISUALIZE THE DIFFERENCE

A WAY TO VISUALIZE THE DIFFERENCE

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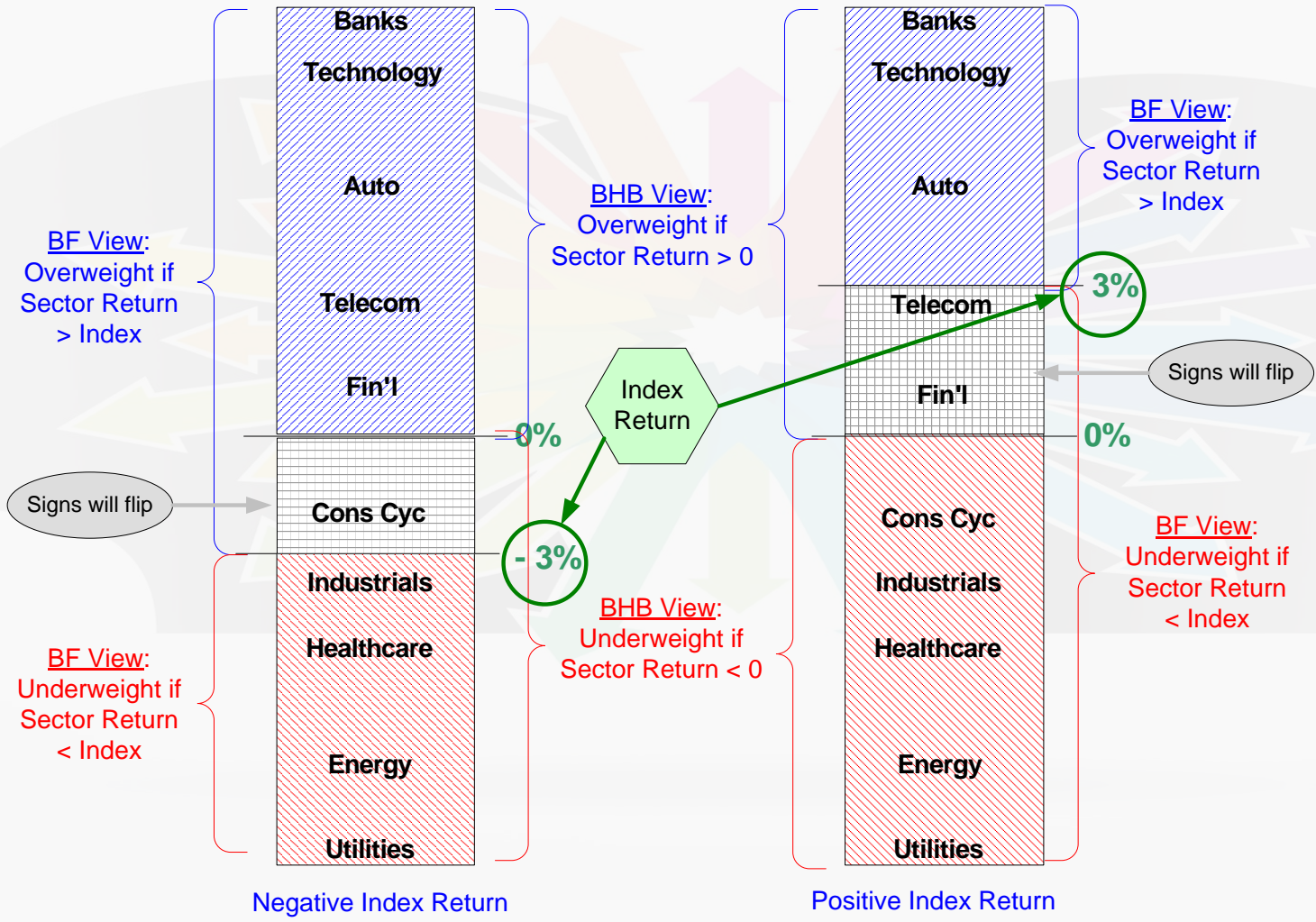
HOW TO EVALUATE RETURNS

THAT DON'T MAKE SENSE

HOW TO EVALUATE RETURNS THAT DON'T MAKE SENSE

- If you've been in performance measurement long enough, you've encountered returns that don't make sense.
- E.g., POSITIVE return and the portfolio LOST MONEY

WHERE DO WE BEGIN?

- I suggest you start with cash flows
- We typically see them, and they're often large, when returns do not make sense

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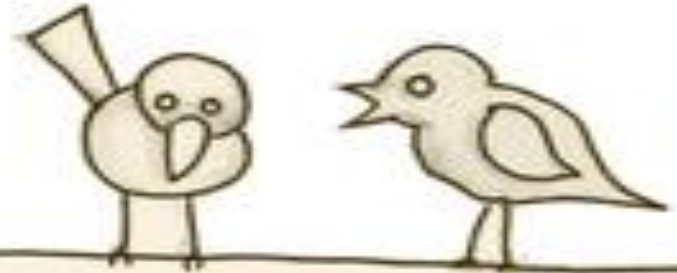# JUST BECAUSE THEY DON'T MAKE SENSE …

- <u>Doesn't mean they're wrong</u>
- When there are sizable moves in the market, following large flows, the resulting returns might not appear to be right, but they actually might be
- The challenge is explaining why they do

David D. Spaulding, DPS, CIPM
DSpaulding@TSGperformance.com
www.TSGperformance.com

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