Alternate Attribution

Measuring What Managers Actually Do
to Differentiate Themselves from the Pack

Mark R. David, CFA

ESSEX RIVER ANALYTICS

Attribution Methodology: Have We Standardized Yet?

- Some clear preferences are forming
  - Arithmetic attribution effects
  - Daily calculation
  - Transaction-based contributions
  - Position-level granularity
  - Exact time-period linking

Managers want attribution to support their story, not produce residuals that distract from it.

ESSEX RIVER ANALYTICS

Attribution Methodology: Have We Standardized Yet?

- But strong market tides have drifted us away from a standard
  - Competition for assets → Differentiate investment process
  - Proliferation of derivatives
  - Increased sophistication of fixed income analysis
  - Liability-based investment
  - Hedge funds

Standardized attribution is not the objective of any manager with a proprietary investment process.

ESSEX RIVER ANALYTICS

Brinson: If Anything Qualifies as a Standard…

- From papers in 1985 (with Fachler, JPM), and 1986 (with Beebower, & Hood, FAJ)
- Differentiates <u>Sector Allocation</u> from <u>Issue Selection</u>
- Understandably popular during the period when most equity management processes centered around these two activities
- See also:
  - Karnosky-Singer, for portfolios with an active multi-currency component
  - Lord, for a seminal fixed income framework

ESSEX RIVER ANALYTICS

Factor-based Attribution – a Rebirth

- Historically based on systematic risk factor research
- Define factors
- Create factor indices
- Measure active exposure to each factor
- Attribute active return to relative exposure by factor
- Coming back into fashion with equity alpha processes based on factor models, especially long-short

Factor-based Attribution – Old Problems Persist

- Factor models specification subject to multicollinearity and over-specification
- Regression method highly dependent on estimation of inputs (factor exposures, correlations) – thus subject to estimation error, nonstationarity
- Results often criticized as:
  - low r-squared
  - non-intuitive
  - highly dependent on attribution period

ESSEX RIVER ANALYTICS

Risk-adjusted Attribution

- Natural and welcome extension:
  - enhancing insight into risk
  - emphasizing information ratios
- Additively decomposes IR into “IR contributions”, by segment and attribution effect
- Extensible to any additive attribution methodology, not just Brinson
- In simplest form, does not require any additional data to implement!

Risk-Adjusted Attribution – Remaining Hurdles

- Key to the IR decomposition is the correlation of attribution effects to active return
- Subject to the all of the same estimation problems, and some new ones:
  - high estimation errors
    - by definition, data only exists since portfolio incept
  - nonstationarity of correlation
    - deliberate – strategy rotation
    - artifacts of changing managers, skills
- Demand and acceptance – likely to improve with time and education

ESSEX RIVER ANALYTICS

Liability-Driven Attribution

- Benchmark defined as stream of liability flows
- Valuation of benchmark is tricky
  - Appropriate discount, key rate curve definitions
  - “Tail” issues
  - Liability stream re-adjustment
- Utility function is very steep on the downside
  - risk of shortfall
- Tremendous recent interest

ESSEX RIVER ANALYTICS

Liability-Driven Attribution Challenges

- LDI techniques are rapidly increasing in sophistication; measurement & attribution methodologies need to keep up with:
  - measuring benchmark performance
  - curve positioning
  - spread bets
  - risk diffusion, shortfall minimization strategies
  - liability stream change anticipation strategies
    - short-term discount rate, actuarial
    - medium-term policy
    - long-term demographic

ESSEX RIVER ANALYTICS

Strategy-based Attribution

- Return attributed to explicitly defined <u>strategies</u>:
  - sets of multiple positions which need not share any attribute other than membership in the strategy
- Equally applicable to absolute or benchmark-relative mandates
- Extremely simple, in concept, to calculate

ESSEX RIVER ANALYTICS

Strategy-based Attribution – Implementation Gaps

- Nonetheless, quite difficult to implement in practice
  - Requires simple yet flexible strategy capture and maintenance interface
  - Need to separate the effects of strategy definition from subsequent implementation
  - <u>Positions</u> must not be netted
    - Neither do tax lots do the job
  - “Trade tagging” is a red herring
    - Real trades often netted across multiple accounts and strategies

ESSEX RIVER ANALYTICS

Decision-based Attribution

- Attribute all return to individual manager decisions
- Capture each manager decision
- Fork portfolio
  - Actual portfolio resulting form decision implementation
  - Hypothetical portfolio supposing decision had not been implemented
- Compare actual portfolio performance to portfolio modeled without decision
- Attractive in concept…

ESSEX RIVER ANALYTICS

Decision-based Attribution – Conceptually Flawed

- Nearly impossible to implement as the sole method in a dynamic environment
  - Decisions are not trades; thus dependent on manager identification of decisions
    - unreliable, onerous and game-able
  - Decisions are causally and serially interdependent
  - Unimplemented decision often ambiguous to specify
  - Exponential proliferation of model portfolios rapidly overwhelms data and computational resources
- Can be part of a tailored methodology, measuring impact of well-structured long-term decisions

ESSEX RIVER ANALYTICS

Tailoring Attribution to the Proprietary Investment Process

- If a process is well-defined, measure the value added by each component or step
- Any of above methods may be used for a given step, if it appropriately measures value added
- Combining stepwise measures:
  - Additive – how much value is added by Step 2 over Step 1? (Works well for serial steps)
  - Subtractive – how much value is added by executing Step 3, compared to <u>not</u> executing it? (Works well for parallel steps)

ESSEX RIVER ANALYTICS

Conclusions

- Start with the investment process
- Carry a toolbox of effective methods
- Apply appropriate methods to individual elements of the process
- Combine elements to measure and compare value added
- Create reports that support the manager’s proprietary story and the way they tell it

ESSEX RIVER ANALYTICS