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NORMALISED STOCK SELECTION FOR BRINSON ATTRIBUTION

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Requirement

This paper describes a custom enhancement made to the FIA attribution engine that implements normalised stock selection. The enhancement has been made for Alcentra, but the functionality is available to all users of version 2.4.0 upwards.

The requirement is as follows:

Alcentra attribution reports attribute to the total (portfolio) level instead of sector level. As a result, users are not able to quickly and easily interpret the best/worst stock selections within sectors.

Alcentra require that security level security selection values sum to the sector level selection/interaction effect value, with the aim that the data will highlight the best/worst picked stocks within sectors.

For convenience, we refer to this revised method of security selection returns as *normalised stock selection*.

Single level Brinson attribution

Consider a portfolio where the manager makes a single asset allocation decision in terms of allocations to sectors. The asset allocation and stock selection returns r_S^{AA} and r_S^{SS} generated by sector S are given by

$$r_S^{AA} = (w_S^P - w_S^B) \times (r_S^B - r^B) \quad (1)$$

$$r_S^{SS} = (r_S^P - r_S^B) \times w_S^B \quad (2)$$

where w_S^P and w_S^B are the weight of the sector in portfolio and benchmark, r_S^P and r_S^B are the returns of the sector in the portfolio and benchmark, and r^B is the overall return of the benchmark. The sector weights and returns are given by

$$w_S^P = \sum_{i \in S} w_i^P \quad (3)$$

$$w_S^B = \sum_{i \in S} w_i^B \quad (4)$$

$$r_S^P = \frac{\sum_{i \in S} w_i^P r_i}{\sum_{i \in S} w_i^P} \quad (5)$$

$$r_S^B = \frac{\sum_{i \in S} w_i^B r_i}{\sum_{i \in S} w_i^B} \quad (6)$$

and the benchmark return by

$$r^B = \sum_{i \in B} w_i^B r_i \quad (7)$$

where the sums are over individual securities in sector S .

Equations (1) and (2) may be interpreted as follows.

- The first term in (1) is the active weight of the sector. If the weight of sector S is the same in portfolio and benchmark, there is no active allocation position and no allocation return will be made.
- The second term in (1) measures the amount by which sector S outperforms the benchmark as a whole. Here we use the return of the benchmark sector as this is outside the control of the investor, and acts as a reference return.
- The first term in (2) is the active return of the sector. If the portfolio sector shows a higher return than the benchmark, this term is positive.
- The second term in (2) is the weight of the sector in the benchmark. The inclusion of this term allows the active return made from stock selection decisions to be weighted by the exposure of the sector in the benchmark. Again, we use the benchmark sector weight as a reference.

Each of these expressions measures the effect of a single type of investment decision. (1) measures the effect of the portfolio sector having different weights to the benchmark, while (2) measures the effect of the portfolio sector having a different return to the benchmark.

Normalised stock selection

Using the same notation as above, the normalised stock selection approach calculates stock selection as follows:

$$\tilde{w}_i^P = w_i^P / w_S^P \quad (8)$$

$$\tilde{w}_i^B = w_i^B / w_S^B \quad (9)$$

For securities held by the fund, stock selection return is given by

$$r_i^{SS} = \frac{w_S^P (\tilde{w}_i^P - \tilde{w}_i^B) (r_i^P - r_S^P)}{w_i^P} \quad (10)$$

For securities not held by the fund, stock selection return is given by

$$r_i^{SS} = \frac{w_S^P (\tilde{w}_i^P - \tilde{w}_i^B) (r_i^B - r_S^P)}{w_i^P} \quad (11)$$

Returns due to asset allocation returns are unchanged under this approach.

Implementation

This additional stock selection algorithm has been implemented in FIA using the *NormalisedStockSelection* switch. If set to '1' or 'True', stock selection returns are calculated as described above. Otherwise, the conventional Brinson approach is used. Asset allocations are unaffected by the use of this switch, and interaction returns (if calculated) are consistent with either set of stock selection returns.

Examples

We have supplied two sample spreadsheets with this document, showing normalised stock selection on a simple equity portfolio.

- In case (1), all securities held in the benchmark are also held in the fund.

- In case (2), the benchmark includes securities not held by the fund.

Output from FIA is also included, showing that the program generates the same results as shown in the examples.

References

'Alcentra Attribution Calculation POC Requirements v2.10', Excel spreadsheet, Alcentra, dated 25th February 2021

'Demo Alcentra calculation', Excel spreadsheet, Flametree