MANAGER CLUSTERING & STYLE ANALYSIS

Manager performance varies over time, driven by factors that they directly control concomitant with those influences that are outside of their control. A manager's investment process begins with a belief system or investment philosophy which dictates which factors from a broad universe of stocks are filtered for consideration in the portfolios that they manage. The aggregation of specific groups of factors that are selected by the manager can be broadly described as representative of the manager's investment style or bias. From there, managers typically perform additional in-depth fundamental and/or near-term technical analyses to create their final portfolio of stocks. However, this initial filtering of factors, described above, leads to either explicit or implicit factor exposures that can have a meaningful impact on performance that is distinctly separate from their stock selection skill.

The core tenet of Aapryl's process is to build passive replications or clones for every product using Returns-based analysis (RBSA) – where factor models are created to explain the asset's returns. A manager-specific clone portfolio is the more relevant benchmark against which the manager's performance should be compared to assess true "excess return". The process of identifying manager factor exposures yields a "beta" profile that can be assessed cross-sectionally across a universe of managers to determine their relative exposure. This application could be used as a starting point for segmenting the manager universe prior to the implementation of Aapryl's methodologies for forecasting peer-group ranking and relative return attribution.

Methodology:

1. Using proprietary regression techniques on the time series of portfolio returns, a manager's "style" is replicated as explained by various fundamental factors. In summary, the clone portfolio is an investable long-only passive factor replication strategy that is easy to implement.

2. To determine the manager's intrinsic style, Quadratic Programming (QP) constrained regression technical is applied to the first set of four, which include Value, Growth, Core and Dividend Yield. The regression methodology adds realistic constrains to the outcomes where each factor exposure is positive (within the range of 0% to 100%) while the sum of all factor exposures adds up to a total of 100%. This in turn avoids betas that are unrealistic to replicate for the clone portfolio.

3. A unique enhancement in Aapryl is to delineate returns between "long-term" and "near-term" time periods.

    · Static Clone captures the average exposures of the manager's full return history since 2001. All available data series is utilized in the regression process to ascertain its dominant style exposure.

    · Dynamic Clone captures a rolling short-term exposure to understand the manager's recent style creep or evolution. Specifically, we apply some advanced techniques using a rolling 36 -month window to capture changes in style quickly. In short, this is how the manager's style is today.

4. Accordingly, the data series is utilized differently to perform the dynamic QP constrained regression (rolling 36-month data series) and the static QP constrained regression (all available data series) to capture the manager's short-term style evolvement and long-term dominant style influence. For the dynamic QP constrained regression, a (24,12) central weighting scheme is employed where past 24 months and forward 12 months of data series is taken for the rolling 36-month time window.

5. Value and Dividend Yield factor exposures are added up to represent the manager's "value" beta. The Growth factor exposure represents the manager's "growth" beta. The spread between value and growth exposures is calculated and compared with respective spread thresholds to set up the demarcation between the value and growth style segments within each universe. A manager would be classified as a value manager if the spread is greater than the spread threshold of value segment; or the manager would be classified as a growth manager if the spread is smaller than the threshold of growth segment; the manager would be classified as a "blend" manager if the spread falls in between the two thresholds.

6. The subsequent tables show both the dynamic and static style determination efficacy report that was performed on all Lipper domestic small cap value and growth funds.

Dynamic Style Determination			
	Value	Growth	Blend
Small-Cap Value Funds	96.33%	0.00%	3.67%
Small-Cap Growth Funds	2.44%	84.35%	13.21%

| Static Style Determination			
	Value	Growth	Blend
Small-Cap Value Funds	87.55%	0.82%	11.63%
Small-Cap Growth Funds	3.46%	82.32%	14.23%

As shown above, no Lipper small cap value fund was classified as growth by Aapryl's dynamic style determination methodology; and for all Lipper small cap growth funds, only 2.44% of them were classified as value. Note that Lipper classifies their funds by holding-based analysis.

7. Aapryl's manager clustering analysis is performed on two separate dimensions; the first dimension is the style determination we elaborated above, the second dimension is the quality axis. For the quality determination process, QP constrained regression (both the dynamic and static methodologies) is applied to all the nine factors which include Quality, Volatility, Defensive, Economic Sensitivity (Dynamic), and Momentum in addition to the four factors used in the style determination. A manager's total quality exposure is determined by adding up the Quality and 50% of the Defensive factor exposures. The Defensive factor, as provided by Russell, equally weights both quality and (low) volatility related components. It should be noted that the quality classification is

determined within each style segment for each universe. Appendix 1 illustrates the definition of all factors that are used in the clustering/ style analysis.

8. Aapryl framework establishes six "style" clusters in total by combining the two dimensions while affording the capacity to capture the style/quality evolvement over time. More importantly, this analysis structure allows monitoring of factor exposures over time and helps understand the drivers for any significant drift. The six peer-clusters are as follows:

- Cyclical/Low Quality Value - value managers with lower quality exposure
- Relative/High Quality Value - value managers with greater quality exposure
- GARP Blend - blend managers with lower quality exposure
- Defensive - blend managers with greater quality exposure
- Cyclical/High Growth - growth managers with lower quality exposure
- High Quality/Stable Growth - growth managers with greater quality exposure

Chart 1: Overview of Aapryl's Cloning and Clustering Methodology
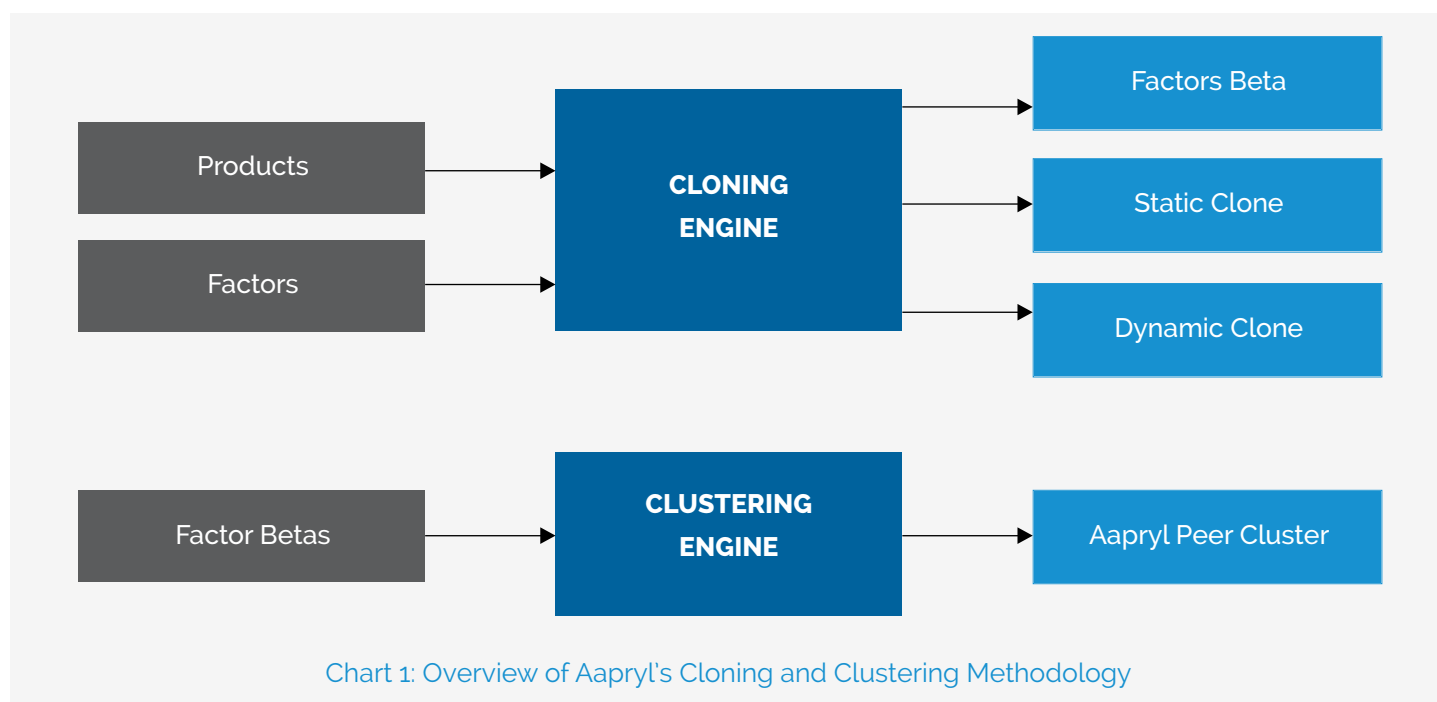
In combination with the above mentioned six style clusters, 4 regional zones (US, Global ex-US, Emerging markets, & Global) coupled with 3 capitalization (Large, Mid, and Small) slices, more than 50 peer clusters are available in Aapryl for peer comparisons and analysis.

To further elaborate the clustering/style research framework with an example - " Manager A – Select Large Cap Value" is the selected manager. All of the following outputs are based on the results from different steps of the clustering/style analysis research framework that is described in this research writeup.

Chart 1 (Style Analysis) below shows the evolution of the manager's style & quality returns over time. This chart is Aapryl's version of the style box that illustrates the results of style analysis through the 2-dimensional lens of its peer clusters. The horizontal (x) axis measures value to growth continuum; while the vertical (y) axis delineates the

"quality" of the manager. The circles show the result of the analysis using this framework. The larger the circles, the more recent the time-period. Product's dominant cluster is highlighted in yellow. The analysis shows that Management has generally been in the Relative/High Quality Value cluster since inception.
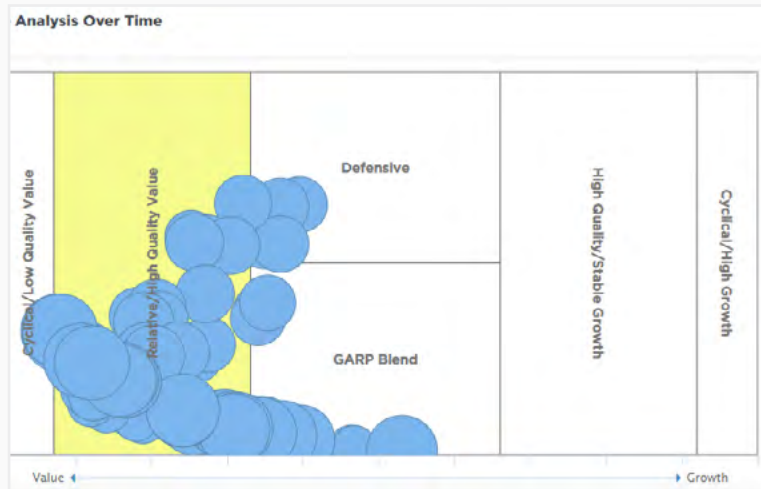

Chart 2: Style Analysis over time across the dimensions of Value/Growth and Quality

Chart 3 below demonstrates the clustering classification for this manager which is Relative/High Quality Value. Both near-term (dynamic) and since inception dominant clusters are highlighted.
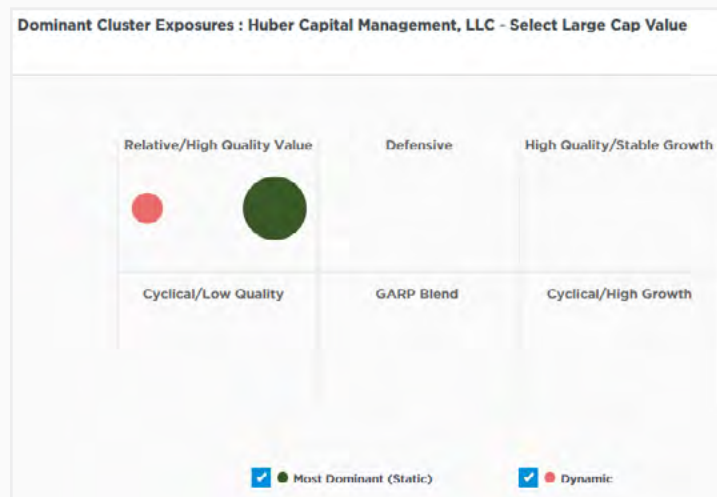

Chart 3: Product Cluster Mapping for long term (static) and near-term (dynamic)

Latest sensitivities or factor exposures (Betas) for Huber Select Large Cap ValueManager A are shown in Chart 4a. For example, about two thirds (63%) of the product's returns since inception (in July 2007) can be explained by its exposure to the Dynamic (Economic Sensitivity) factor as seen in the static clone characterization. The remainder of the manager's return can be explained by Dividend Yield and Value factors.

Change in factor composition for the product over the past 3 years is illustrated in Chart 4b as Dynamic Clone. Huber's Manager A's exposure to the economically sensitive Dynamic factor has markedly decreased to 31%

(compared to a long-term exposure of 63%) over the last 36 months while exposure to Dividend Yield has tripled to 60% and is now the most dominant factor.
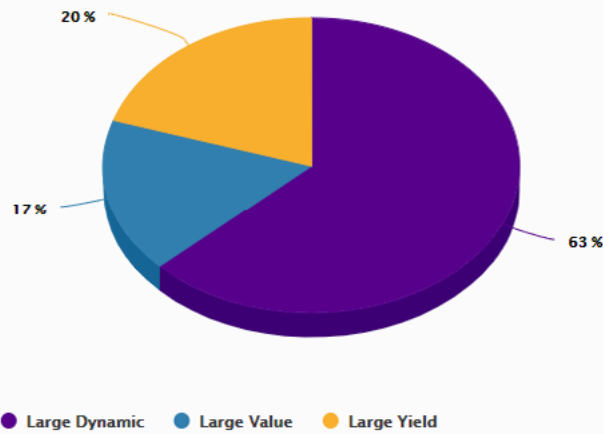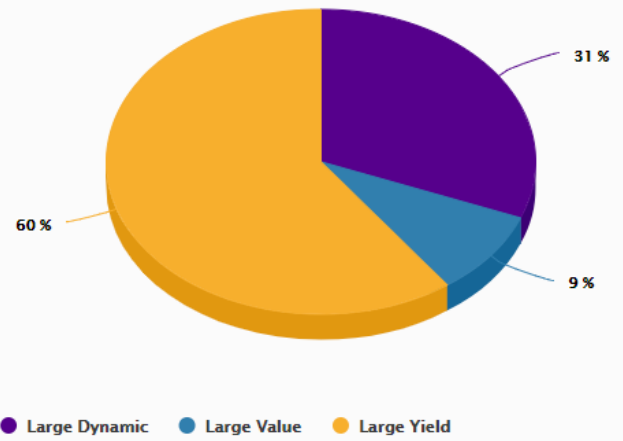

Chart 4a: Factor Weights for Static clone

Chart 4b: Factor Weights for Dynamic clone

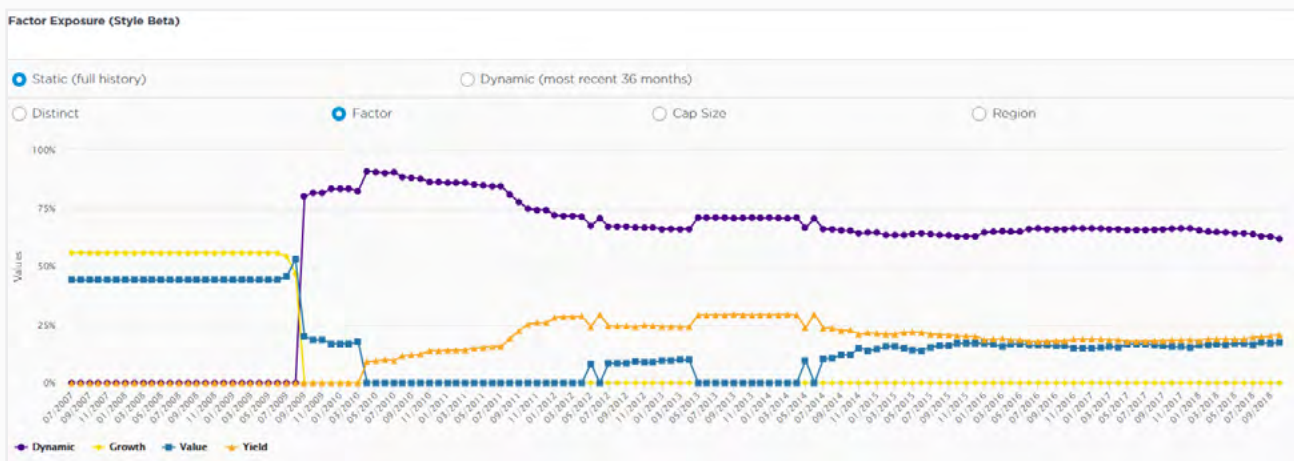The final chart (chart 5) shows the profile of various factor exposures over time for this manager.

Chart 5: Factor exposure over time

Appendix I: Factor Definition

Growth: measures the performance of companies that have growth characteristics such as high growth rates, price to earnings or price to book ratios.

Value: measures the performance of companies that have value characteristics such as low price to earnings or price to book ratios.

Momentum: measures the performance of companies that exhibit high price momentum relative to the market.

Quality: measures the performance of companies that exhibit high quality relative to the market based on characteristics such as ROA, leverage and earnings stability.

Yield: measures the performance of companies that have a higher dividend yields relative to the market. Volatility: measures the performance of companies that exhibit relatively lower volatility.

Economic Sensitivity: measures the performance of companies that have relatively less stable business conditions and are more sensitive to economic cycles, credit cycles and market volatility.

Defensive: measures the performance of companies that have relatively stable business conditions which are less sensitive to economic cycles, credit cycles and market volatility.

For more information on how Aapryl's proprietary methodologies can be used please contact us at **info@aapryl.com**