Articles

Core Vs. Blend
By David Blanchett

While Value and Growth investing styles are typically purely defined, the "middle" style tends to be more subjective. Most indexes that seek to track the middle style are typically "Blend," whereby they hold stocks that are considered both Value and Growth. This approach implies that investing in the "middle," or Core, is not worthwhile and that an aggregated Blend approach is enough. In order to determine if Core is a worthwhile investing style, the historical performance differences of the domestic equity Morningstar Large Cap Core, Mid Cap Core and Small Cap Core are compared against the performance of the Morningstar Blend indexes and the Russell indexes (which are also Blend) on a return and market-factor-adjusted basis. The results of the analysis suggest that while the outperformance of Core over Blend is not statistically significant, Core indexes have historically outperformed Blend indexes on a return and market-factor-adjusted basis, with slightly less risk.

Investing In Style

The concept of investing in styles is not new. In 1934 Graham and Dodd documented the superior performance of strategies that invest in high-dividend yield stocks in the U.S. This gave rise to what has become known as the value style (although it's likely had different names through time). In 1977 a study published by S. Basu documented that low P/E stocks had historically outperformed large-cap stocks in the U.S. by a margin that could not be explained by conventional measures of risk. Similarly, in 1981 a study published in the *Journal of Financial Economics* by Rolf Banz documented that small-cap stocks had historically outperformed large-cap stocks in the U.S. by a margin that could not be explained by conventional measures of risk. This was followed by a number of other papers, perhaps most notably research by Fama and French [1992] that identified risk factors that are highly correlated with long-term historical returns, namely company size and value orientation.

The findings of Basu, Banz and other researchers that followed gave rise to the concept of the "Style Box" introduced by Morningstar in 1993. The equity Style Box is a nine-square grid that classifies securities by market capitalization along the vertical axis and by value and growth characteristics along the horizontal axis and has become perhaps the most commonly utilized method of categorizing U.S. equity mutual funds. Morningstar's equity style methodology uses a "building block," holdings-based approach that is consistent with Morningstar's fundamental approach to investment research. Style is first determined at the stock level and then those attributes are "rolled up" to determine the overall investment style of a fund or portfolio.

The importance of style investing can be witnessed in the naming methodology utilized by many U.S. fund companies that call funds "Mid-Cap Growth" or "Small Value," etc., to inform the potential investors of the target equity exposure of the fund. Style groups, such as those used by Morningstar in its fund categories, have become the primary peer groups for mutual fund comparison purposes and funds that have performed well historically (e.g., are "5 star" funds within their respective Morningstar categories, etc.) tend to feature such information prominently in sales materials. Morningstar even implicitly recognized the importance of rating funds within specific styles versus broad groups when it changed its Star Rating system in 2002.

Core Vs. Blend

A variety of companies such as Dow Jones, Morningstar, MSCI, S&P and Russell have developed indexes that track the performance of the various domestic equity styles (i.e., the complete style box). While it is impossible to directly invest in an index, there are a variety of ways an investor can obtain those market exposures, e.g., through an index mutual fund or ETF. The methodologies across index providers, though, can differ materially. These differences can result in varying market exposures and varying returns, something that has been documented by Israelsen [2007], among others.

While market capitalization is a relatively straightforward way to determine a stock's relative total value, it becomes more complex when considering things like free float, whereby the number of shares outstanding are adjusted based on those available for trading. However, there is considerably more disagreement about what makes a stock "Value" or "Growth" than its respective market capitalization, which is why providers use varying methodologies to make the distinction. For example, the Dow Jones methodology uses "six intuitive fundamental factors" to determine whether a stock is Value or Growth, and then determines the aggregate style score by measuring a stock's "Euclidian distance" from the growth and value seeds. S&P uses three factors to measure Growth and four factors to measure Value, while Morningstar has a 10-factor model that assigns a 50 percent weighting to forward-looking estimates and a 50 percent weighting to historical values. Once a stock has been categorized as Value or Growth, it is then allocated to the respective index accordingly, and even here, the methodologies can vary. For example, Russell uses a "non-linear probability" method to assign stocks to the Growth and Value style indexes.

For each of the major providers, Value and Growth tend to be well-defined, but the "middle" is not. The middle is typically identified with "Blend," which represents that market-capitalization-weighted proxy for all the stocks within that given size range. In contrast, Morningstar utilizes an approach where stocks are assigned to three different "buckets": Growth, Core and Value, with "Core" representing stocks that are not identified strongly with either the Growth or Value categories. This differs from most providers in that the "middle" style is viewed as a distinct investing style, not simply the market capitalization combination of all the stocks in the style. Morningstar's Core approach results in a much more precisely defined "middle" style, as is depicted in Figure 1. Note how the dispersion around the centroid, or weighted average size and style exposure of the index, is considerably less than the Russell 1000 or S&P 500, indexes which are both Blend, rather than Core.

Figure 1
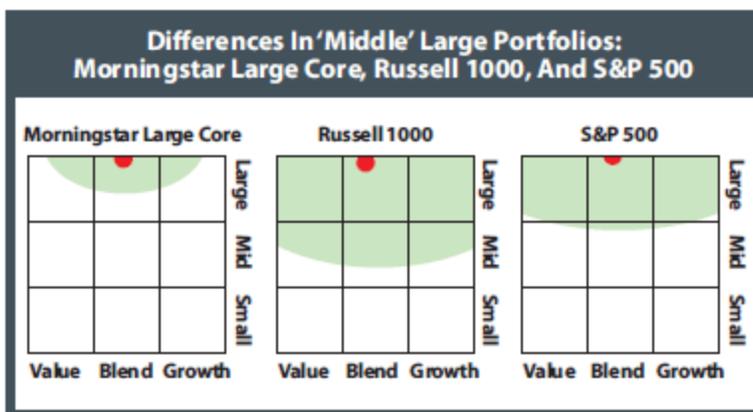
Source: Morningstar

Analysis

An analysis was performed in order to determine whether Core represents a more advantageous method to invest in the "middle." For the analysis, Morningstar's Core indexes are used as the proxy for Core, while Morningstar's Blend indexes and the Russell indexes are used as proxies for the Blend approach. Morningstar Core was the only Core approach considered for the analysis. While it would be possible to synthetically create other Core indexes, such as by synthetically creating an S&P Core index based on those securities excluded from either the S&P Pure Growth Index or S&P Pure Value Index (since these remaining stocks, which

would be 34 percent of the S&P 500 Index, would be considered Core), only Morningstar Core is used because it is the only Core strategy currently available as an investment (via a family of iShares ETFs). Two definitions of Blend are included. The Morningstar Blend indexes were selected since they have the most similar underlying construction methodology and factors as the Morningstar Core indexes. The Russell indexes were selected to represent Blend as well since they are the most widely known for benchmarking in the investment industry.

Monthly returns for the respective indexes were obtained from Morningstar Direct. Two tests are performed based on monthly returns over the longest period of data available at the time of the analysis, from July 1, 1997 to May 31, 2010. For both tests, the monthly return of the Blend benchmark index (either Morningstar Blend or Russell) is subtracted from the return of the respective Core index (Morningstar Core) over the entire time period. This type of analysis is most similar to a two-sample t-test assuming unequal variances.

The first test compares the raw performance for the two strategies. Past research by Blanchett [2010] has noted that indexes have varying factor exposures that have a significant impact on performance. For the second test, the returns of each index are compared against a market-factor-adjusted portfolio, and then to each other. The market-factor-adjusted portfolio was determined based on a single four-factor (i.e., Carhart) regression over the entire period of monthly returns. This approach removes any potential tilts an index may have that would skew its raw performance (e.g., it has a Small tilt and/or Value tilt). All data for the beta factors, as well as the risk-free rate, was obtained from Kenneth French's website.

For the four-factor regression, the excess return of the index (which is defined as the return of the index for the month minus the risk-free rate for the month) is regressed against a Market Beta factor (defined as the return on the market minus the risk-free rate); a Value factor (or HML, defined as the return on Value stocks minus the return on Growth stocks); a Size factor (or SMB, defined as the return on Small stocks minus the return on Big stocks); and a Momentum factor (based on the six value-weight portfolios formed on size and prior two- to 12-month returns, the average return on the two high prior-return portfolios minus the average return on the two low prior-return portfolios). The four-factor regression equation is:

$$R_{index} - R_f = \alpha_{index} + \beta_{index} (R_{market} - R_f) + \beta_{SMB}(SMB) + \beta_{HML}(HML) + \beta_{MOM}(Momentum) + \varepsilon_{asset}$$

Where R_{index} is the return on the index, R_f is the risk-free rate, α_{index} is the alpha of the index, β_{index} is the index's beta with respect to the market, R_{market} is the return of the market, β_{SMB} is the index's beta with respect to the "Large" factor (SMB), β_{HML} is the index's beta with respect to the "Value" factor (HML), β_{MOM} is the index's beta with respect to the "Momentum" factor (MOM) and ε_{asset} is the error term. For those readers not familiar with the four-factor regression approach, see Fama and French [1993] and Carhart [1997].

Cremers, Petajisto and Zitzewitz [2008] have noted that the standard Fama-French (three-factor) and Carhart (four-factor) regression models can produce statistically significant nonzero alphas for passive indexes primarily from the disproportionate weight the Fama-French factors place on Small Value stocks (which have performed well). While Cremers et al. introduce regression factors that outperform standard models in their paper, the traditional four-factor estimates are used for this research, due to their widespread use and acceptance.

The regression factors for the nine test indexes are included in Appendix I. Note that only the Morningstar Core indexes had positive intercepts for the each of the three indexes (i.e., positive monthly alpha). Morningstar Blend had negative intercepts for Large Cap and Small Cap, while Russell had a negative intercept for Small Cap that was quite large in absolute terms, of -0.24 percent (with a t-statistic of -2.81). The R^2 values are higher for Morningstar Blend and Russell than for Morningstar Core. This should not be surprising given the factors are constructed using broad market-cap indexes (most similar to the Wilshire 5000) that are more similar to a Blend approach than a Core approach.

Appendix I

Four Factor Results									
	Morningstar Core			Morningstar Blend			Russell		
	Large	Mid	Small	Large	Mid	Small	Large	Mid	Small
Intercept	0.03%	0.03%	0.05%	-0.02%	0.03%	-0.07%	0.01%	0.09%	-0.24%
Mkt-RF	0.89	0.98	1.00	0.96	1.02	1.01	0.98	1.03	1.00
SMB	-0.26	0.08	0.53	-0.23	0.18	0.61	-0.14	0.21	0.75
HML	0.12	0.48	0.48	-0.06	0.26	0.30	0.02	0.23	0.27
Mom.	-0.02	-0.07	-0.08	-0.01	-0.04	-0.09	-0.02	0.01	0.01
R^2	89.91%	87.79%	91.89%	98.66%	94.71%	96.38%	99.42%	95.62%	97.36%

Sources: Morningstar Direct, Kenneth French

Results

The monthly geometric average performance results for the test indexes are included in Figure 2, and the correlations across capitalization groups are included in Figure 3. The Morningstar Core indexes tended to have higher average returns than the respective Morningstar Blend and Russell indexes over the test period, as well as lower risk, which is defined as the standard deviation of monthly returns. Not surprisingly, the Morningstar Core indexes were more similar to the Morningstar Blend indexes (versus the Russell indexes), given their similar construction methodology. Also, not surprisingly, the Morningstar Blend indexes were more similar to the Russell indexes (versus the Morningstar Core indexes), since both represent "Blend" styles of investing.

Figure 2

Average Historical Monthly Returns, July 1997 - May 2010									
	Morningstar Core			Morningstar Blend			Russell		
	Large	Mid	Small	Large	Mid	Small	Large	Mid	Small
Geomean	0.29%	0.51%	0.64%	0.19%	0.47%	0.47%	0.27%	0.56%	0.38%
Std Dev	4.53%	5.35%	5.96%	4.76%	5.39%	6.11%	4.83%	5.37%	6.19%

Source: Morningstar Direct

Figure 3

Correlations											
	Large Cap				Mid Cap				Small Cap		
	MCore	MBlend	R1000		MCore	MBlend	RMid		MCore	MBlend	R2000
MCore	1.00	0.94	0.93	MCore	1.00	0.95	0.92	MCore	1.00	0.98	0.93
MBlend	0.94	1.00	0.99	MBlend	0.95	1.00	0.99	MBlend	0.98	1.00	0.98
R1000	0.94	0.99	1.00	RMid	0.93	0.99	1.00	R2000	0.94	0.98	1.00

Source: Morningstar Direct

Figure 4 contains information regarding the statistical significance of the differences in the monthly returns for the Morningstar Core indexes versus the Morningstar Blend indexes on both a raw return basis and on a market-factor-adjusted basis. The Morningstar Core indexes outperformed each of the three Blend indexes on a raw return basis, although none of the t-statistics were statistically significant. The outperformance of the Morningstar Core indexes over the Morningstar Blend indexes is less on a market-factor-adjusted basis because the indexes have varying "tilts" that have been corrected for. For example, the Morningstar Large Core Index is slightly more value-oriented than the Morningstar Large Blend Index, which contributes positively to its raw return outperformance. However, although the Morningstar Core outperformed Morningstar Blend on a factor-adjusted basis for all three capitalization groups, the outperformance wasn't significant at the 5 percent level.
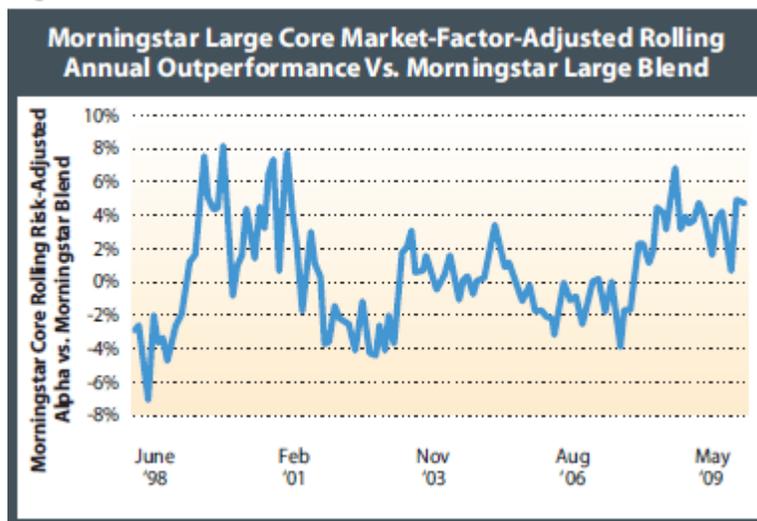
Figure 4

	Raw Return Difference			Replicating Portfolio Alpha Difference		
Monthly Returns Test: Morningstar Core vs. Morningstar Blend July 1997 - May 2010						
	Large	Mid	Small	Large	Mid	Small
Geomean	0.08%	0.02%	0.15%	0.04%	0.00%	0.11%
Std Dev	1.60%	1.70%	1.30%	1.34%	1.24%	0.98%
t-stat	0.62	0.13	1.44	0.36	-0.05	1.42

Source: Morningstar Direct

Figure 5 shows the Morningstar Large Core market-factor-adjusted rolling annual performance versus Morningstar Large Blend for the entire test period. Note that while the aggregate average is positive, there are significant variations during the test period.

Figure 5

Morningstar Large Core Market-Factor-Adjusted Rolling Annual Outperformance Vs. Morningstar Large Blend

Source: Morningstar Direct

Figure 6 contains information regarding the statistical significance of the differences in the monthly returns for the Morningstar Core indexes versus the Russell indexes on both a raw return basis and on a market-factor-adjusted basis. While the Morningstar Large Core Index had a higher average monthly geometric return than the Russell 1000 (0.293 percent vs. 0.274 percent), it had a negative return when the differences were compared on a monthly basis. The results of the market- factor-adjusted test were generally the same as the raw return test, except the Morningstar Large Core Index had a higher return than the Russell 1000 when the returns were factor-adjusted. The outperformance of the Morningstar Small Core Index over the Russell 2000 becomes more pronounced versus the raw return at +0.27 percent per month (which works out to 3.27 percent per year). Over the entire test period, the cumulative Morningstar Small Core outperformed the Russell 2000 by over 50 percent. The outperformance is also statistically significant at the 5 percent level (i.e., has a t-statistic greater than 2 in absolute terms).

Figure 6

	Raw Return Difference			Replicating Portfolio Alpha Difference		
Monthly Returns Test: Morningstar Core Vs. Russell, July 1997- May 2010						
	Large	Mid	Small	Large	Mid	Small
Geomean	-0.01%	-0.07%	0.22%	0.02%	-0.07%	0.27%
Std Dev	1.67%	2.04%	2.18%	1.37%	1.43%	1.52%
t-stat	-0.07	-0.42	1.25	0.15	-0.57	2.21

Source: Morningstar Direct

Conclusion

The results from this analysis suggest that Core appears to be a better "middle" investing strategy than Blend. The Morningstar Core indexes tended to have both higher relative returns and higher factor-adjusted returns than their respective Morningstar Blend and Russell capitalization peers, although most of the results were not statistically significant. Therefore, it may be worthwhile for investors seeking non-Value and non-Growth style exposures to consider investing in the true "middle," which would be a Core approach, versus a Blend approach, which is currently the most popular.

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