STYLE ANALYSIS OF SUSTAINABLE FUNDS

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ABSTRACT

Sharpe's methodology with Quadratic programming is used to determine the exposure to passive indices which act as proxies for asset classes that would best replicate the performance of a fund's portfolio over a specified time frame. This study shows how mutual funds scored with sustainable-investing grades related to social, environmental and corporate governance screens stack up to style-specific custom Benchmarks in terms of net returns. Data on mutual funds and passive indices is freely available online from different sources such as Yahoo, Morningstar, Russell Indexes, etc., and using this data, style analysis can be performed by anyone. **JEL classification**: G11

INTRODUCTION

Sustainable Investing

A large number of investors care about the environment, social issues, and corporate-governance (ESG), or 'sustainable investing'. Assets under management in portfolios that use various approaches to sustainable investing have grown to an estimated $23 trillion globally, an increase of more than 600% over the past decade, according to Morningstar. (see Powell (2018), Choe, (2016)). Kacperczyk et al. (2005), first showed that actively managed mutual funds with portfolios concentrated in a few industry sectors tend to outperform. They argued that this cross-sector concentration is an indication of fund managers' self-assurance and ability. This study used a sample of 131 funds (HS 131) concentrated in issues related to sustainability.

Style Analysis

A mutual fund investor does not always comprehend the investment strategy or style adopted by the manager. Sharpe introduced through his two articles in (1988) and (1992) a technique called Return Based Style Analysis (RBSA), using only returns, breaks down the strategy of the manager into exposures of mutual fund to different asset classes, called "Style". Without knowing the style, it was difficult to determine why a fund portfolio behaved the manner in which it did. At a time of expensive equity valuations, responsible steward is more important than it has been over the years. It is also important that the manager's style is consistent and predictable. In this study

a manager's style is identified and used to evaluate his performance against a proper Sharpe-style-custom-benchmark designed to fit the manager's style.

Passive vs Active Management

A passively managed fund holds assets with weights similar to those for benchmark index and aims to mimic returns generated by the selected index. It follows fixed investment rule and has a consistent static "style" or exposure to asset classes mainly because of a buy-and-hold strategy. Deviating from benchmark indexes, actively managed fund follows manager's discretion, aims to outperform benchmark indexes and provide style as well as "skill" with selection of securities. Skill involves providing a return in excess of that generated by static mix of assets net of management fee. Whether active managers possess skill that justifies active fee, and whether they possess it consistently over several business cycles has always been open to debate. Not anymore. Investors transferring funds from active management to passive management has been evident and unsettling for quite some time. In a study over fifteen years ending December 2016, 82% of all U.S. funds underperformed their respective benchmarks according to S&P Indices versus active funds scorecard. (See, Maxey, 2017). If the study did not consider "survivorship bias", (i.e., failed funds excluded because they did not survive) underperformance of active funds relative to passive funds is even worse.

Performance evaluation of a mutual fund is mainly dependent on a benchmark that takes into consideration style of the manager. Style is then identified by exposures to different indexes that proxy for different asset classes. For instance, if manager's style is large cap growth stocks, then the benchmark should be comprised of a passive index that represents large cap growth stocks. In fact, if the benchmark were good, it should explain most of the variability-due to style and market movements- in returns of the manager. Under-performance or over-performance relative to the benchmark can then be chalked to skill. Now the problem is for most managers of mutual funds, their varied styles can't be mimicked by single-index benchmarks (see, Morningstar Sustainable Funds U.S. Landscape Report (2017)). So, in this study passive indices are used as explanatory variables to identify the investment strategy and the portfolio manager's style. As latest holdings of mutual funds are often not available, RBSA may be pursued by an investor. Further, a large number of managers do not stick to their mandated style because of competitive pressure. It is easier to outperform competition by taking on more risk by a manger than the other competitors. It is up to the investor to know how tolerant to risk he is and choose a mutual fund that provides him that level of risk on a consistent basis. By doing style analysis, investors can assess volatility of their portfolios as measured by variability in the time series returns. Those investors driven by Sustainability values may manage higher risk exposures of active funds by designing portfolios carefully. They also need to focus on returns relative to benchmark (or style) portfolios.

This study addresses the following research questions:

1. How to evaluate a manager's investment style-with wide variability in asset allocation- when a standard passive benchmark with the same style is not available? RBSA helps in creating style specific benchmark for each fund; it identifies that combination of passive indices that best explains the fund performance.

2. How do sustainable funds stack up to style-specific custom Benchmarks in terms

of net returns?

3. How much of the fund performance is due to style and how much is due to skill or luck?

4. Do style portfolios that mimic the performance of a fund provide a better investment alternative to investing in a fund itself?

The rest of the paper is organized as follows. While section 1 reviews the literature, section 2 describes data and methodology. Section 3 discusses the empirical results. Section 4 concludes.

LITERATURE REVIEW

Manager universes were used as benchmarks for performance evaluation (see Bailey (1992)) until the RBSA technique of Sharpe (1988) and (1992) became popular. Return-based style analysis (RBSA), its comparison with holdings-based-style analysis as well as applications of the style portfolios, are presented in detail by Lucas and Riepe (1996), De Roon (2000), ter Horst et al (2004). Style models-both returns based as well as holdings based- are well documented by Kaplan (2003).

Different styles followed by managers are documented by Christopherson (1995), Brown and Goetzmann (1997). Managers may not always stay true to their given style mandates. There is evidence that four out of ten of all equity Mutual funds have been totally misclassified or partly misclassified. (For example, See diBartolomeo and Witkowski (1997), Kim, Shukla and Thomas (2000)). Daniel et al., (1997) examine 2500 equity funds for a period of two decades from 1975 through 1994 to answer the question whether portfolio managers show market timing and stock selection abilities. Their results provide some selection skill but show no timing ability.

Style analysis uses style-weighted asset indexes to mimic return performance of a mutual fund portfolio. Several improvements to the basic technique are suggested to increase the effectiveness. Confidence intervals for these mimicking weights can be approximated by the methodology described by Lobosco and DiBartolomeo (1997).

Traditional style weights refer to the fund average behavior over a time the sample is studied. Modifications to improve style estimates relate to capturing recent influences or style varying with time. (See Swinkels and Van Der Sluis (2002)). These improvements are important in evaluating funds where strategy shifts are expected.

Fung and Hsieh (2002) suggest style factors that are volatility related. Bondarenko (2004) opines that variance risk is priced and constructs an index whose return is a function of the variation between implied and realized OEX volatility. DiBartolomeo (2006) reviews literature on dispersion of security returns within asset classes. A good review of style of hedge funds can be found at Brown and Goetzmann. (2003). For an estimation of fundamental style of U.S. equity funds and comparison with RBSA see Rekenthaler, et al; 2006 and Mason, et al; 2012.

Relationship between ESG criteria and corporate financial performance (CFP) has remained a dominant topic portfolio managers and researchers for more than forty years (Friede et al. (2015). Wimmer *(2013)* analyzes the persistence of ESG-scores in socially responsible (SR) mutual funds and shows that they persist for approximately two years. This study further shows that the lack of long-term persistence in the ESG-scores is caused by changes in the holdings of the SR mutual funds. (also see Utz and Wimmer (2014))

Belghitar et al. (2014) provide evidence that risk-averse investors can improve their expected utility by reducing their holdings of SR firms and purchasing conventional ones. They tested this proposition by constructing Zero cost portfolios created by shorting the SRI index and using the proceeds to invest in the conventional index. They show that these zero cost portfolios provide higher returns and lower variance than either of the two indices standing alone. (also see Renneboog et al. (2011), Mollet, and Ziegler (2014))

There is a growing body of literature that studied relationship between environmental, social, and governance (ESG) criteria and CFP, corporate financial performance. (CFP) has been the subject of over 2000 studies and roughly 90% of studies find a nonnegative ESG–CFP relation. ESG factors are increasingly being considered in the investment decisions (see, Ashwin Kumar et al. (2016), Schramade (2016), Syed and Ntim (2017), Sherwood and Pollard (2018)) and are having positive impact on corporate financial performance (Friede et al. (2015))

While Schramade (2016) discussed the integration of ESG into mathematical models, Syed (2017) discussed beliefs about ESG for the UK and French fund managers. Sherwood and Pollard (2018) show that integrating ESG emerging market equities into institutional portfolios could provide institutional investors the opportunity for higher returns and lower downside risk than non-ESG equity investments.

Meanwhile, Parida (2018) by investigating fund investment flows, shows that investors perceive top corporate socially responsible funds as relatively safe and invest more in them during financial crisis. Nofsinger and Varma (2013) showed that compared to conventional mutual funds, socially responsible mutual funds out perform during periods of market crisis and underperform during the other periods. They attribute this to ESG factors and not differences in portfolio characteristics or management. (Also see Borgers et al. (2015), Ghoul, and Karoui (2017)) Ghoul and Karoui (2017) show that compared to low-CSR funds, high-CSR funds display poorer performance, stronger performance persistence, a weaker performance-flow relationship, and comparable persistence in flows. A higher ESG score attracts fund flows (see, Kleeman (2018)).

DATA AND METHODOLOGY

Data Sources And Sample Selection

For analysis, "high sustainability rated" mutual funds from the Morningstar database were selected. This Morningstar Sustainability Rating is a measure of how well the holdings in a portfolio are managing their environmental, social, and governance, or ESG, risks and opportunities relative to their Morningstar Category peers. The rating is a holdings-based calculation using company-level ESG analytics. Top 10% of sustainability rated funds that have history of monthly returns for the period October 2011 through August 2016 were analyzed.

Table 1 provides summary characteristics of the sample funds. A typical HS131 fund has average asset size of $1.5 billion with manager tenure of a little over seven years. A manager change in a mutual fund is generally viewed as an indicator of a potential problem. 12b-1 fee is levied by all funds except five of them. This suggests that smaller funds rely mostly on 12b-1 plans as a way to sell more funds, grow at a

fast rate, and increase their fund asset size. Additionally, funds with 12b-1 plans have higher expense ratios, higher load fees, and higher indirect costs (turnover ratio). One factor that an investor can control is the expense ratio of the mutual funds that he invests in. Average net expense ratio for these 131 active funds is 1.4% whereas index funds can be bought with expense ratios as low as 0.03%. Expense ratios include management fee, 12b-1 fee, administrative fee, operating costs, and other costs. Only thirteen funds levy redemption fee with an average fee of 1.6%. All the funds charge front load with an average of 5.4%. Higher turnover levels generally add to the expense ratio. A typical HS131 fund has 75% turnover, meaning the fund replaces three-fourths of its holdings over a 12-month period. Index funds have turnover no greater than 5%. A low turnover results in low trading costs for the fund and increased returns for shareholders. These trading costs are not included in a fund's expense ratio. A high turnover results in a higher-than-average amount of capital gains and funds with high portfolio-turnover are not tax efficient.

One hundred thirty one (HS131) funds comprise the sample. Each sustainable fund's allocation style portfolio is constructed using Sharpe-style analysis (1992). Table 2 shows benchmarks used in the analysis.

Methodology

Returns based style analysis (RBSA) propounded by Sharpe in two articles (1988) and (1992) is simply an asset class factor model that explains variability in mutual fund returns by regressing fund returns on different factors – returns on several passive indices- with constraints that regression coefficients be positive and sum to one. Style is essentially exposure to asset classes. Using this powerful and widely popular RBSA technique, a combination of positively weighted style portfolios that best explains fund returns is identified while minimizing the sum of squared residuals. Sharpe's model (1992) is shown in Equation (1):

$$ R_t = \sum_n b_n F_n + u_t \qquad (1) $$

R_t represents the return on mutual fund portfolio, b's represent slope coefficients of asset n in period t, F_{nt} the return of the asset n in period t, and u_t are the residuals. $\sum_n b_n F_n$ is designed to capture the "style" while ut captures the skill or security selection of the manager. Each mutual fund performance is comprised of one, a style (i.e. exposure to assets) attributable to market and two, a skill (i.e. security selection) attributable to manager. Sharpe's model used in this study uses six asset classes represented by six indices. Six Style asset indices are listed in the table 2.

Fund returns are regressed on asset class returns. The regression coefficients, sometimes called "style weights" are then viewed as the fund's effective exposures to the assets. The set of style weights not only define the style, they also provide the best benchmark for evaluation of performance. Difference between return on the fund and that of a passive portfolio with the same style is termed as the fund's "tracking error".

RESULTS

6 Factor- Style Regression Results for High Sustainability Funds (HS131)

RBSA uses returns of funds employing different investment strategies and several explanatory variables representing asset classes. A strategy's exposure to asset classes is interpreted as a measure of portfolio manager's style. The important stylistic differences were captured for HS131 funds with six asset investment factors, as shown in Sharpe (1992). To evaluate a manager's performance relative to a style benchmark, holding risk constant, the generation of excess return, the consistency of the excess return, and the length of time of the excess return are very important.

Analysis of HS131 funds finds that most of the fund returns are fully explained by these asset factors. Results show that Market may have properly priced HS131 sample of funds. The authors find that unexplained returns are not statistically different from zero in the full time period 201110 to 201608. Impact of sustainability factor appears small. There is no observable "value added" over a five year period.

Table 3 panel A shows the "style" exposures of the subject fund (large stocks, European stocks, Bonds, etc.) expressed as percentages of the different indices that best mimic the fund's return behavior over time.

Table 3 panel B Results show how much of the mean return is due to style or asset mix and how much is due to selection or skill. Investors can judge for themselves whether or not the managers generate returns in excess of those generated by style portfolios. Results also show the amount of risk taken by the fund vs the risk incurred by the style. These results can be used in performance measurement by an investor to diversify his portfolio across different styles. An average of potentially changing styles over October 2011 through August 2016 of 131 funds is listed in panel C. Figure 1 presents graphically the results of panel C, a summary of estimated styles of 131 funds. This analysis constrains each coefficient to lie between 0 and 100% and the sum to be 100%. Discarding the funds with zero exposure, 98, 94, and 106 funds have average exposure of 46%, 23%, and 38% to U.S Large cap stocks, European Stocks, and U.S. Mid-cap & Small-cap stocks respectively; 59, 67 and 56 funds have an average exposure of 7%, 12% and 7% to assets U.S. bonds, Pacific equity, and U.S. Treasury securities respectively.

Figure 2 provides a pie chart in which Style regressions show that the selected six asset classes effectively replicated the performance of a majority of mutual funds -rated highly sustainable- through high average 84% R-square. Only 10% of the funds have an R-square of 68% or less. R-square clearly shows returns on mutual funds are well correlated with returns on six asset classes and these asset classes explain over 84 percent of the variance in a typical mutual fund. A measure of the proportion of the fund variance due to active management, (i.e., percent active funds = 1 – R-square) is approximately 16% with a standard deviation of a little over 14% and a median of 11.47.

Figure 3 shows selection return distribution with an average of -0.95% and a standard deviation of 2.87%.

Equally Weighted High Sustainable 131 (HS131) Funds Portfolio

To estimate the composite style of 131 sample funds, an equally weighted portfolio of these funds is created. This portfolio's style mix -exposure to the six asset classes- is shown in the table 4. All results are based on monthly returns, expressed in percentage terms. Annualized average selection return for the HS131, (i.e., excess return over a period of nearly five years on the portfolio relative to style mix) is negative 0.726% per year, while risk of the portfolio is much higher than that of the style. Though managers were active, on an average, HS131 managers underperformed benchmark and did not add value per unit of added risk.

Table 5 results suggest that a typical SR mutual fund has not added value through active management; it has an average annual fund return of 11.73 percent, style return of 12.69 percent, with an average annualized selection return of -0.95 percent. The average %Active, selection Sharpe ratio and percentiles are 15.91, -0.21 and 37.07 respectively. Correlation between %active (i.e. proportion of the fund variance due to active management) and selection Sharpe ratio (i.e. a measure of value added through active management per unit of added risk) is very weak, -0.00428. Fund performance in excess of the benchmark is not significantly related to active management as revealed by %Active and selection Sharpe ratio. Correlation between %active and percentile (i.e. higher the Percentile, in a group of managers with zero skill, higher % would have poorer performance due to luck) is very weak, -0.01091.

Average R-square of 131 funds (100-15.91) % = 84.09% shows that the selected asset classes explain over 84% of the variance in a typical mutual fund. The averages of annualized standard deviation for fund, style and selection are respectively 12.58 percent, 11.14 percent, and 4.88 percent. Most importantly, the average fund does not outperform the style benchmark as shown by selection return of -0.95 percent. Average selection Sharpe ratio -0.21 with standard deviation of .53 and a median of -.24 shows that on average, there is no extra benefit provided by the manger for extra risk taken. Another striking result is that only 25 percent of 131 funds have %Active greater than 20.03 percent (Quartile 3 = 20.03 percent) suggesting that not many managers pursue active management. Our results indicate that, on average, more concentrated funds, such as HS131 funds do not perform better after controlling for risk and style differences. This finding suggests that investment ability is not quite evident among managers who hold portfolios concentrated in environment, social issues, and corporate-governance (ESG), or 'sustainable investing'.

Discussion

While individual investors focus on absolute returns, institutional investors often focus on relative returns. HS131 funds have a very high systematic risk resulting in high R-square shown in the results. Asset allocation explained on an average 84% of variability in returns of the funds with a standard error of 1.26%. Mode of R-square, the value that occurs most often is 91.8%. Despite the generally poor performance of 131 funds, there are some winners. 46 out of 131 funds (35% of the funds) have positive selection ratio. Out of these 46, only four (see Table 6) have statistically significant results of adding value through active management. These four are: American Century

Mid Cap Value A, Janus Enterprise A, MFS International Value A, and Oppenheimer International Small-Mid Co A funds. A large number of 84 out of 131 funds (64% of the funds) have negative selection ratio. Out of these funds, underperformance of eight is more pronounced and significant. These are: 1919 Socially Responsive Balanced A, American Growth Fund Series Two E, Deutsche Real Assets A, Federated InterContinental A, Optimum Small-Mid Cap Growth A, Pioneer International Equity A, Transamerica Multi-Cap Growth A, and Victory Special Value A. From October 2011 through August 2016, active funds added to volatility levels and underperformed the benchmark, on average. Some of the reasons for underperformance by active managers were holding more cash, indulging in excessive trading that reduced gains, and not-enough diversification that reduced returns. One limitation of RBSA is it can be useful if a manager does not substantially vary exposures to different asset factors. As the exposures are based mainly on how the fund's returns move with those of the asset classes, they reflect the behavior of the fund, and may not show the percentages invested in various asset classes.

Limitations of The Study

In this study, Sharpe returns based style analysis (RBSA) is used to create a benchmark tailored-for-each-fund based on exposures to a set of 6 passive asset indexes. One important limitation of style analysis is the underlying assumption that the style exposures do not vary over time. A number of studies have documented that time variation in style exposure does occur. Another limitation is that Holdings based can detect drift faster than returns based because it uses only recent data. Returns based analysis uses mostly past data so it is heavily influenced by history and is slow to show drift.

Style can also be determined by holdings in a portfolio. The Morningstar studies conclude that holdings-based style analysis (HBSA) generally produces more accurate results than returns-based style analysis (https://corporate.morningstar.com/us/ documents/MethodologyDocuments/FactSheets/StyleAnalysis_Factsheet.pdf) There are limitations to HBSA also. In holdings-based style analysis, each of the actual holdings of a mutual fund portfolio-security by security- is categorized to identify its style based on sensitivity to different asset classes; e.g., 20% large-cap value stocks, 10% short-term government bonds, and so on. In this approach the focus is on composition of the portfolio. This process is not only time consuming it is also error prone because it is quite subjective. To do the present study, holdings-based approach would require 131 portfolio holdings for each month for nearly sixty months and then these holdings need to be categorized into style.

In returns-based-style analysis (RBSA), the focus is not on actual holdings but on overall behavior of the portfolio based on its exposure to a set of passive indices. Index exposures are considered to be more relevant than actual portfolio holdings. This reasoning gives advantage to RBSA. What matters is why a fund acted the way it did - and whether that was the result of shrewd choices by the manager. It is also pertinent to mention that fund managers do not always reveal every trade. They may disclose their holdings periodically, but the portfolio's composition may be quite different in between reports. In practice, the effectiveness of holdings-based style analysis depends on the effectiveness of the underlying risk model. The risk model

translates historical holdings data into portfolio style, or risk, data.

CONCLUSION

This paper investigates the investment styles in "131 Mutual Funds with High Sustainability Rating" (HS131) by Morningstar. This study helps an investor understand return performance of a mutual fund decomposed into that based on security selection and that based on asset class mix. Using style benchmark, performance of a mutual fund is evaluated.

"Style", a fund's exposure to six major asset classes, with constraints that each asset exposure (1) is greater than or equal to zero, (2) less than or equal to 1 and (3) the sum of asset exposures equal to 1, is determined using Sharpe's RBSA. These "best fit" style portfolios provide an investment alternative to holding a mutual fund itself. While a manager's mandate is to outperform the returns on style portfolios, the results show many of the managers do not. Their performance reflected no more than investment style.

R-squared shows goodness of fit of the style benchmark and it shows that style portfolios capture most of the systematic factors that influence the returns of the mutual funds. When a single index, say, S&P 500, is used, differences and variations in style and market exposure can't be adjusted.

Investor should control the asset allocation decision based on long term goals and risk, not based on what styles are in favor and whether the market is expected to go up or down. This study helps an investor diversify across styles of managers.

This study suggests that the investor is better off allocating assets Identified by the style benchmark using passive index funds instead of choosing actively managed HS131 funds. With a passive index fund, investor does not get better than average returns. But active managers of sustainable funds did not usually beat the market either. While a lot of research has been published on the performance of ESG funds, there is not much research in the area of persistence of performance of these funds. For future research this study suggests analyzing the persisting performance of ESG funds.

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TABLE 1: CHARACTERISTICS AND SUMMARY STATISTICS FOR HS131 FUNDS FOR THE PERIOD OCTOBER 2011 THROUGH AUGUST 2016

Characteristic	Average of 131 funds
Total Assets $MM	1513.577319
Manager tenure years	7.424275362
Turnover ratio %	75.4257971
Annual Report Net Expense Ratio %	1.404710145
Front load %	5.431159
Redemption Fee % (based on thirteen funds)	1.615385
Max Management Fee %	0.807826
12b-1 fee % (on all except 5 funds)	0.259058

TABLE 2: SELECTED PASSIVE STYLE INDICES FROM VANGUARD FOR 6 ASSET CLASSES

Asset Category	Passive Index
A1, Asset 1: Large Stocks	Vanguard 500 Index: 500 of the largest U.S. companies.
A2, Asset 2: Europe	Vanguard International Equity: European Stock Index. More than 1200 European Stocks. Makes up approximately half of non-U.S. equity.
A3, Asset 3: Mid & Small Stocks	Vanguard Index: Extended Market; 3000 Mid and Small Cap Stocks; complement to Vanguard 500 index fund. Together they provide exposure to entire U.S. Equity Mkt.
A4, Asset 4: Bonds	Vanguard Long Term Bond Index: Total Bond Market. U.S. Investment Grade, maturities more than ten years. 60% Corp. bonds, 40% U.S. government bonds.
A5, Asset 5: Pacific	Vanguard International Equity: Pacific Stock Index. 2150 stocks in developed countries of the Pacific region. Makes up roughly a quarter of non-U.S. equity.
A6, Asset 6: MM	Vanguard Treasury Money Market Reserves - U.S. Treasury securities Portfolio. Short term U.S. T'bills. Most conservative investment option.

A fund's exposure to six asset classes each represented by an index, describes its style.

Panel C: Styles based on average of 131 funds

Asset	Allocation
A1, Asset 1: Large Stocks U.S.	0.344664122
A2, Asset 2: European Stocks.	0.175251908
A3, Asset 3: Mid & Small Stocks U.S.	0.282603053
A4, Asset 4: Bonds U.S.	0.054458015
A5, Asset 5: Pacific Stocks.	0.093450382
A6, Asset 6: Money Mkt.	0.049572519

* Panel A: Style Exposures of HS131 Funds are available on request.
* Panel B: Performance of Fund, Style, Selection statistics are available on request.

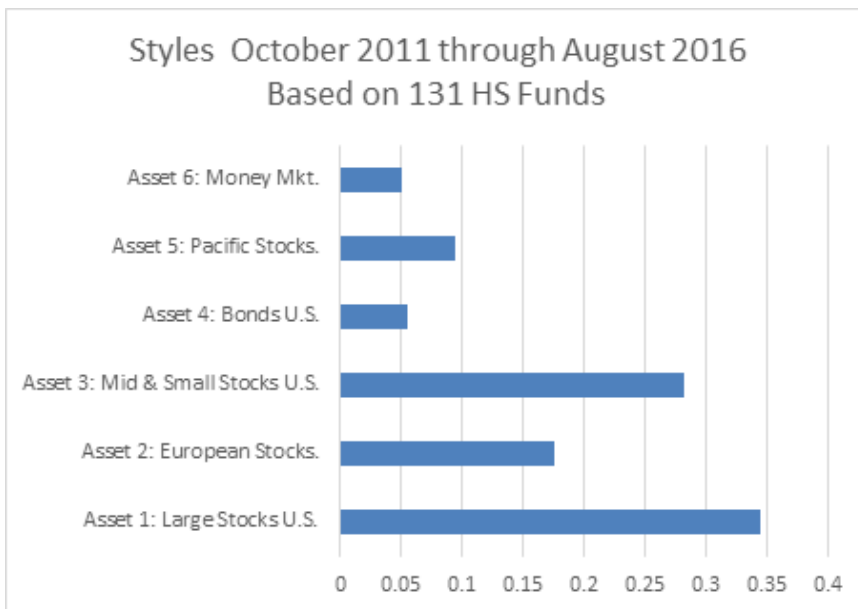**Figure 1: Styles of 131 mutual funds**

FIGURE 2: R-SQUARE ATTRIBUTED TO STYLE AND (1 - R-SQUARE) TO SELECTION OF 131 MUTUAL FUNDS
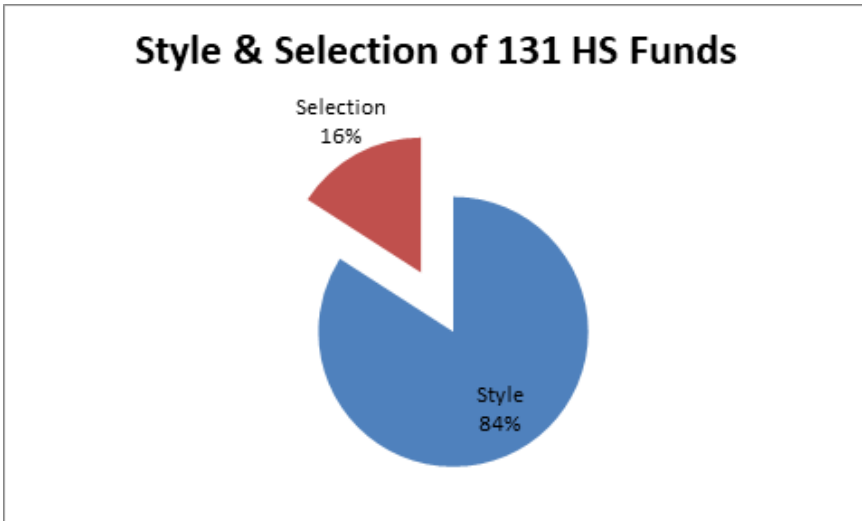

FIGURE 3: SELECTION RETURN FOR EACH MONTH IS THE DIFFERENCE BETWEEN THE FUND RETURN AND THE STYLE RETURN FOR THAT MONTH
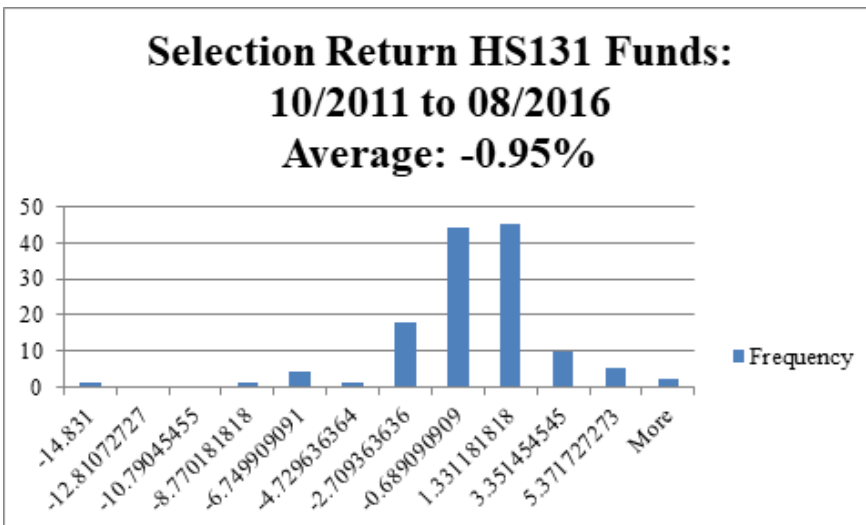
TABLE 4: SHARPE STYLE RESULTS FOR EQUALLY WEIGHTED PORTFOLIO OF 131 MUTUAL FUNDS FOR THE PERIOD OCTOBER 2011 THROUGH AUGUST 2016

Two Tables

DATA: 201110 through 201608

STYLE:

E-W 131 MFs	A1	A2	A3	A4	A5	A6
	0.367	0.165	0.32	0.005	0.095	0.047

DATA: 201110 through 201608

ANNUALIZED VALUES:

STATISTICS:

E-W 131 MFs	Fund	Style	Selection	Pct active	Sel. Sharpe Ratio	T-Statistic	Percentile
Mean	12.525	13.251	-0.726	0.37	-1.03	-2.29	1.09
Std. Dev	11.507	11.488	0.702				

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TABLE 5: FUND, STYLE, AND SELECTION PERFORMANCE FOR PERIOD 201110 TO 201608

	Annualized Values			Statistics			Annualized Values		
	Fund	Style	Selection	Pct. active	Sel. Sharpe Ratio	Percentile	Std. Dev. Fund	Std. Dev. Style	Std. Dev. Selection
Mean	11.73	12.69	-0.95	15.91	-0.21	37.07	12.58	11.14	4.88
Std. Dev	4.17	2.85	2.87	14.43	0.53	30.61	3.25	2.27	3.01
median	12.49	13.55	-0.75	11.47	-0.24	29.97	12.45	11.36	4.01
Quartile 1	9.81	10.30	-2.26	6.90	-0.58	9.77	10.82	10.21	2.95
Quartile 3	14.73	15.17	0.53	20.03	0.12	60.10	14.64	13.07	5.90
Minimum	-3.88	0.50	-14.83	2.00	-1.52	0.04	2.95	0.77	1.12
Maximum	20.90	16.10	7.39	98.57	1.44	99.93	27.45	14.98	21.12

TABLE 6: MUTUAL FUNDS THAT ADDED OR NOT ADDED VALUE THROUGH ACTIVE MANAGEMENT

Panel A: Mutual funds with statistically significant results of NOT adding value through active management.											
Mutual Fund	A1	A2	A3	A4	A5	A6	Pct Active	Sel. Sharpe Ratio	T-statistic	Percentile	1-%active
1919 Socially Responsive Balanced A	0.543	0.012	0.135	0.066	0	0.244	4.44	-1.24	-2.74	0.31	0.9556
American Growth Fund Series Two E	0.703	0.11	0.159	0.008	0	0.02	14.64	-1.52	-3.37	0.04	0.8536
Deutsche Real Assets A	0.156	0.076	0.062	0.333	0.115	0.257	25.48	-1.41	-3.13	0.09	0.7452
Federated InterContinental A	0	0.518	0.17	0	0.313	0	8.02	-1.17	-2.6	0.47	0.9198
Optimum Small-Mid Cap Growth A	0	0	1	0	0	0	6.53	-0.94	-2.08	1.9	0.9347
Pioneer International Equity A	0	0.505	0.167	0	0.328	0	3.69	-0.97	-2.15	1.6	0.9631
Transamerica Multi-Cap Growth A	0	0.025	0.86	0	0.115	0	24.7	-1.1	-2.45	0.72	0.753
Victory Special Value A	0.627	0.052	0.321	0	0	0	9.46	-0.98	-2.18	1.46	0.9054
Panel B: Mutual funds with statistically significant results of adding value through active management.											
American Century Mid Cap Value A	0.474	0	0.351	0.046	0	0.128	7.17	1.09	2.42	99.22	0.9283
Janus Enterprise A	0.142	0	0.664	0	0.009	0.185	6.65	1.15	2.56	99.47	0.9335
MFS International Value A	0.206	0.288	0	0.108	0.318	0.081	13.02	0.91	2.01	97.78	0.8698
Oppenheimer International Small-Mid Co A	0	0.424	0.216	0	0.173	0.187	18.49	1.44	3.19	99.93	0.8151