

## Investment strategies when selecting sustainable firms

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### Abstract

“Sustainability” is the most recent construct to describe efforts by modern corporations to include environmental, social, and economic governance considerations in business operations. Such non-financial areas of firm performance have received increased focus, especially in recent years as firms seek to differentiate themselves from competitors. Of central concern to analysts and investors is whether the emerging emphasis on sustainability is financially rewarded by market participants. Research on this question has generally supported the idea that firms with greater attention to sustainable business practices outperform their peers financially; presumably because of the perception of lesser future risk. This study examines the efficacy of passive versus active investment strategies when selecting sustainable firms for inclusion within an equity portfolio. Utilizing two groups of “sustainability-focused” firms of varying degrees, this study finds financial support for an active selection of sustainable firms on a risk-adjusted basis. Specifically, the financial performance of the Dow Jones Sustainability Index (DJSI) and a group of Sustainability Leaders are compared with the broader market over a 10-year period. Thus, it can be understood whether an investor would have received a greater risk-adjusted financial return through either (1) an active “sustainability-focused” approach, (2) a passive sustainability-focused approach, or (3) a passive broad-market approach. The evidence presented here supports efforts to identify global sustainability leaders by industry, as they collectively showed greater financial performance over the past decade than both the DJSI and the broader market. © 2016 Academy of Financial Services. All rights reserved.

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## 1. Introduction

Over the past two decades, numerous researchers within the financial industry have attempted to establish a link between a firm's financial performance and their proclivity to embrace sustainable business practices. In doing so, these researchers have attempted to find significant variance between the financial performance of companies that embrace sustainable business practices and those whose concern for environmental, social, and governance competencies (ESG) is less evident. The results of these studies have relevance not only for managers, analysts, and investors, but also policymakers and regulators who are increasingly turning their attention to non-financial outcomes of corporate performance. Given that non-financial aspects of corporate performance are less quantifiable, and thus less readily identified by investors (compared with the traditional financial performance outcomes), informational inefficiencies can be expected in stock prices of firms who assign greater emphasis to ESG factors.

Presumably, finance theory supports the argument that a company's overall value increases as it better incorporates sustainable business strategies into its operations. This is based on the logical connection between the implementation of such strategies and the stabilization of future cash flows and reduction of corporate risk exposure. To date, there has been a disparity in the results of existing Corporate Sustainability Performance (CSP)–Corporate Financial Performance (CFP) studies, much of which can be attributed to the ways in which corporate environmental, social, and governance performance are determined and how financial performance is measured. While there are many established metrics for financial performance, including the market price of a firm's stock or financial ratio analyses of historical performance, the metrics for non-financial corporate financial performance are still in the early stages of development.

For those investors that believe CSP is relevant to the firm selection aspect of their investment strategy, and that markets for sustainable firm equities is semi-strong-form efficient, they have the option of passively investing in one of the hundreds of “socially responsible” mutual funds. Such mutual funds invest in a basket of sustainable companies, selected based on one of the myriad of established rubrics assessing and identifying these companies. Alternatively, an investor can adopt a more active investing approach, based on their belief that there are semi-strong-form inefficiencies for CSP-focused firms. Investors using this approach attempt to exploit informational inefficiencies in the market for sustainability-focused firm equities by selecting “sustainable” stocks, based on a more in-depth assessment of a firm's CSP.

This study will (1) review existing literature for the measurement of CSP and CFP, (2) examine how CSP data are assimilated into the marketplace, and (3) attempt to determine if one of these two approaches to sustainable investing (active vs. passive; not taking into account transaction costs) would have yielded better results on a risk-adjusted basis over the past decade in global equity markets. Our approach utilizes a comparison of market returns to those of two sustainable firm portfolios using four, common risk-adjusted portfolio performance statistics. Here, sustainable firms are separated into two groups: (1) a portfolio of all firms selected for inclusion in the Dow Jones Sustainability Index (DJSI), and (2) a separate portfolio of only those DJSI firms that were selected as “Supersector Leaders.”

The potentially unique role of firms that the DJSI identifies as “leaders” among the group of sustainable firms has scarcely to be studied. While we do not find evidence of inefficiencies in the market for all DJSI firms, we do find that there are likely semi-strong inefficiencies in the market for “leading” CSP firms, as evidenced by their ability to earn abnormal returns over the period studied. These results imply that an active investing approach may be useful in this segment of the sustainable-firm equity market.

## 2. Previous research

Current theoretical discussions of the relationship between a company’s financial performance and broader-based assessments of firm performance attempt to yield insights into whether non-financial performance measures add any new information for corporate stakeholders, especially investors. Existing CSP–CFP studies normally seek to determine if a firm’s choice of sustainable business practices enables it to achieve better financial results. Because researchers have used a variety of traditional metrics for financial, and non-financial performance, results have been mixed (see Orlitzky et al., 2003, for meta-analysis of 52 studies). Some studies have found that companies that demonstrate stronger performance in non-financial areas, such as environmental, social, and governance (ESG) also have comparatively more financial accomplishments, whereas others have failed to establish that link. Where the data have supported this link, the financial valuation premise follows that firm value is increased because sustainability practices stabilize future cash flows and lower forward risk. The question that investors must consider is whether such information is already reflected in market prices. If not, investors should endeavor to identify those firms whose equity values do not yet fully reflect their non-financial efforts. In investment analysis, such firms would be considered “undervalued” and good candidates for addition to a value-focused portfolio of corporate stocks.

### 2.1. *Measuring corporate sustainability performance: Existing studies*

The growing market for ratings of non-financial performance is partially driven by the investor’s need for more (and better) information about public companies’ environmental, social, and governance activities. As analysts seek insight into future financial performance, they are increasingly examining other aspects of firm output that are less-obvious, and perhaps, not yet priced by financial market participants. Such non-financial measures face greater scrutiny as investors attempt to (1) identify which aspects of sustainability most highly correlate with inclusion in “sustainable funds” and (2) discover which of these aspects most frequently contribute to future financial success.

For example, Berry and Junkus (2013) found that (1) investors generally consider environmental practices to be the most important aspect of a firm’s sustainability performance, and (2) that investors prefer to reward firms that display positive social behavior (i.e., “positive screening”) rather than excluding firms for particular products or practices (“negative screening”). Flammer (2013) finds “that companies reported to have behaved responsibly toward the environment experience a significant stock increase.”

One of the shortcomings of such existing studies is that social and environmental performances are distinct, non-financial outputs. Moreover, non-financial performance has not, historically, been measured and reported on a large scale to the investing public. Therefore, comprehensive assessments of CSP have been difficult. There have been a number of recent attempts, however, to develop broad-based measures of sustainability to better inform investors about a firm's non-financial performance. These measures represent an improvement on existing measures that are based on a single sustainability component—social, environmental, or governance. The inclusion of all three focus areas seems to be, in part, motivated by the hierarchical structure of the 1997 Global Reporting Initiative (see Labuschagne et al., 2004) as many of the most popular comprehensive rating systems were developed in the early 2000s.

While previous studies that focus on a single facet of non-financial performance are important to the evolution of thought on the topic, more recent studies of the CSP–CFP relationship utilize a more inclusive and multifaceted approach to rating a firm's social/environmental/governance performance. Some of the more notable rating systems which attempt to measure sustainability performance by considering all three of these corporate outputs include the Domini Social 400 Stock Index (see Baird et al., 2012), the DJSI, and the Financial Times Sustainability Index (FTSE4Good), as well as a large number of other comprehensive benchmarks dedicated to corporate stocks of a particular country or geographic region ([www.world-exchanges.org/sustainability/m-7-0.php](http://www.world-exchanges.org/sustainability/m-7-0.php)). As indicated by the types of firms that have developed these comprehensive assessments, the primary driving force behind these new measures was investor's unmet need for better information upon which to select sustainable companies for inclusion in their portfolios.

More recent studies of these sustainability indices attempt to assess the financial impact of a firm's addition to or removal from a particular index. From an investor's point of view, we assume the addition of a company to a list would result in a financial market benefit stemming from the recognition of the firm's sustainability efforts, and enhanced future value. Robinson et al. (2011) find that although there is a sustained increase in the financial value of a firm that is added to the DJSI, there is an insignificant effect when a firm is removed. Conversely, Doh et al. (2010) assert that there is more meaning in being removed from a comprehensive sustainability index (i.e., the Domini Social 400), than being added; which results in no significant impact. With such mixed results, it seems that little informational value is gleaned by simply examining the financial performance firms that are being added to or removed from these sustainable indices.

## *2.2. Measuring corporate financial performance*

The measurement of firm financial performance is well-established, although there are two distinct approaches to financial metrics used in prior CSP–CFP studies. Existing studies focus on accounting- or market-based measures. The findings of such studies do often show that sustainability practices are more apparent in one financial metric versus the other type. For example, Orlitzky's (2003) meta-analysis that examined 52 prior studies dating back to 1975 found that accounting based measures of financial performance better reflected CSR efforts compared to market-based measures. Many studies, such as Rodgers et al. (2013) find

that a firm's CSR commitment leads to better financial performance on both accounting-based and market-based financial metrics. Overall, most recent studies, whether using accounting-based measures (see Ameer et al., 2012; Lopez et al., 2007) or market-based measures (see Hill et al., 2007; Shank et al., 2005) have found that financial value is created when firms are recognized as being relatively more sustainability-focused than their peers.

The question that arises for sustainability-focused investors is how to best identify firms that are making a long-term strategic commitment to sustainability. Investors that want to reward such commitment by a firm, and seek to achieve above-market performance by purchasing these potentially undervalued stocks would benefit significantly from greater insight into the risk-return tradeoffs of such securities. Commitment to sustainability would seem a continuum, with some firms embracing sustainable business practices to a greater extent than others. Several recent CSP–CFP studies have found that a firm's level of commitment does matter in whether the firm enjoys the financial rewards of a sustainable strategy. Barnett and Salomon (2012) find, after categorizing companies as “low,” “moderate,” or “high” CSP firms, that those with high CSP have the highest CFP, arguing that whether it pays to be good depends on how well a company is able to capitalize on its sustainability efforts. Similarly, Lourenco et al. (2012, 2014) find that financial success is greater for firms with a reputation for sustainability leadership when compared with firms not considered leaders in non-financial performance.

### *2.3. The valuation issue and market efficiency*

As previously noted, many existing studies have found evidence for the financial market relevance of non-financial performance information. This information is utilized in the formation of many of the existing stock indices that positively screen companies with dedicated sustainability efforts (i.e., the DJSI, Domini Social 400, and FTSE4good). The purpose of the development of these indices was to assist investors in better identifying firms with exceptional sustainability records and a clear commitment to the continuation of such efforts. Finance theory, which posits that the goal of a manager is to maximize shareholder wealth, would support activities by the firm to increase future cash flows or to reduce forward risk. Support of the link between more sustainable firms and lower corporate risk can be found in Lee (2009) and Ghoul et al. (2011). Moreover, investors who believe that a firm's long-term commitment to sustainability impacts the value of a stock, would value new sources of non-financial information for assimilation into their stock screening methodologies.

Currently, the lack of consensus on the impact of CSP and limited availability of non-financial market factors represents a market inefficiency juxtaposed to the established and highly efficient nature of existing financial market factors. This information asymmetry is narrowed as measures for non-financial factors become more comprehensive and more widely used in indices such as the DJSI and DJGI. Therefore, the question increasingly becomes whether sustainability-focused investors can depend on these indices to identify and fully differentiate the most sustainable firms from less sustainable firms and the broader equity market.



#### 2.4. *Passive versus active investment strategies*

According to North and Stevens (2015), a passive investment approach is supported by efficient market arguments that active trading of stocks will not consistently beat the market on a risk-adjusted basis. Our study looks for evidence that there may be semi-strong form inefficiencies in the market for sustainable firm equities. For individual investors, especially those that value firms adopting sustainable business practices, the opportunity to outperform passive selections of sustainable firm portfolios may exist. In our study, we found that actively selecting a portfolio of only firms determined to be industry leaders in sustainable business practices over the past 11 years earned positive alphas compared to both the sustainability index fund, and the general market. According to the Efficient Markets Hypothesis (EMH), those firms identified as “Supersector Leaders” by the DJSI should not outperform a portfolio of sustainable firms as a whole (all firms comprising the DJSI) if this information is quickly priced in the market for sustainable firm stocks. Like North and Stevens, we believe our approach offers a rigorous test of semi-strong market efficiency for a particular subsector of equities, and the performance of two, specially selected portfolios.

Passive investment strategies are more appropriate for markets where there is high informational efficiency; meaning that sustainability-focused investors may be best served by choosing to merely buy shares in a diversified portfolio of stocks of sustainable firms. Such firms are normally included in broad-based portfolios that have been constructed by selecting companies implicitly labeled as sustainability-focused by being included in a sustainability index. Theoretically, the newer measures, such as the DJSI, which utilizes a number of non-financial performance data simultaneously, would increase the informational efficiency in the market for sustainable firm equities.

Several recent studies have compared the financial performance of firms selected for inclusion in one of the major sustainability indices to benchmarks of the broader market. Of those, Consolandi et al. (2009) found that the DJSI (focused on sustainable European firms) slightly underperformed market benchmarks from 2001 to 2006. Xiao et al. (2013) investigated the role of corporate sustainability (using the DJSI) investment in asset pricing from 2001 to 2007 and found no significant impact on equity returns. Such results would suggest there is no additional informational value to investors of a firm being included in the comprehensive benchmarks of Dow Jones, Inc. that identify sustainable company stocks. However, the potentially unique role of firms that the DJSI identifies as the leaders among the group of sustainable firms has scarcely to be studied.

Conventional investing wisdom suggests stock investors adopt an active portfolio management strategy in markets that are not relatively efficient, whereby market participants do not possess all relevant information when selecting securities for inclusion in their portfolios. As investors seek to identify sustainable companies, the question is whether the information currently used by such investors is adequate. Although studies have suggested that little relevant information is provided when a firm is selected as a member of the DJSI, It is possible that a firm’s identification as a top-performer in the non-financial arena does have investment value.

Similar to the way in which Lin (2014) sought to determine if an individual investor might benefit from active management in equity sector allocations (compared to passively managed

sector index funds), the goal of our study is to determine if (and how) individual investors might benefit from active management in the market for sustainable firm equities. Like Lin, we also find support for active management based on superior risk adjusted returns for one of our two portfolios (as measured by the Sharpe Ratio) compared to the passive portfolios tested.

In summary, our study seeks to examine the CSP–CFP relationship by comparing the risk adjusted stock market returns over the past decade of two distinct, sustainability-focused portfolios constructed using DJSI selected companies. The first portfolio is comprised of all firms that have been added to the index over the past 10 years, and the second is comprised of those firms identified as Supersector Leaders of the DJSI. In this way, we will determine whether an investor would have performed better than the overall equity market by passively “buying the index” versus actively buying stocks of only those firms identified by DJSI as sustainability leaders in their respective industries. Since prior studies have found that the level of a firm’s sustainability commitment is relevant, our study will determine whether those companies specifically identified as sustainability leaders do perform better, using a market-based, risk-adjusted approach. In addition, since Barnett (2007) found that financial impacts of CSR vary over time, we will divide the 2002–2012 period into three subperiods to discover any temporal differences.

### 3. Data and methodology

Two methodologies were adopted and utilized for assessing returns for Supersector Leaders against the broader market (for this study, the S&P 500 is used as a proxy for the performance of the broader market). The first methodology (“Annual Supersector Leader Portfolio”) consisted of creating a balanced (equally weighted) portfolio out of the 18 to 19 companies named in each “class” from 2002 through 2012 and regressing their mean (arithmetic) monthly returns from the time of each classes’ inception through March 2013 against the monthly returns of two indexes, the S&P 500 and the Dow Jones Sustainability Index World Diversified (WISGI). The second methodology (“Cumulative Portfolio”) consisted of creating a balanced cumulative portfolio of Supersector Leaders. Beginning in 2002, a portfolio was created out of the 18 original Supersector Leaders. Each time a new company was named as a Supersector Leader in a subsequent annual RobecoSAM Corporate Sustainability Assessment, it would be added to the portfolio from that date. Meanwhile, any company previously named a Supersector Leader would remain within the portfolio regardless of whether or not it was again named as a Supersector Leader in any subsequent year. Hence, the cumulative portfolio annually increased in size as demonstrated in Figure 1.

#### 3.1. Annual Supersector Leader portfolio

The first step in analyzing the returns of the Supersector Leaders, as ranked by the DJSI (based on the RobecoSAM Corporate Sustainability Index), was to obtain the monthly returns of each individual company named as a Supersector Leader, by year (i.e., the monthly

### Cumulative Supersector Leader Portfolio 2002 to 2012 (# of Leaders Identified)

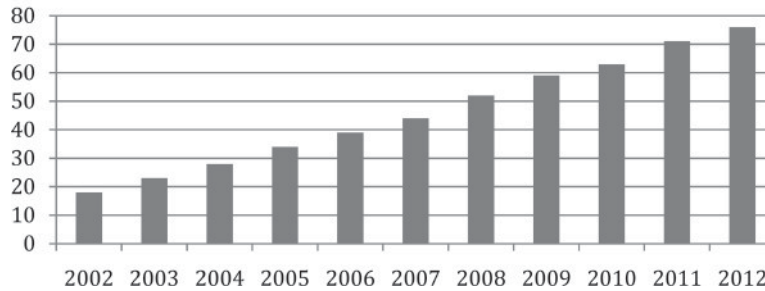


Fig. 1. Graphic demonstration of cumulative Supersector Leader portfolio size (2002 to 2012).

returns of the 2002 Supersector Leader class were gathered from September 4, 2002 through March 1, 2013 and averaged).

Second, the mean (arithmetic) monthly returns of each Supersector Leader class, by year, were compared to the monthly returns of the S&P 500 in terms of Jensen's Alpha, M-Square, the Treynor Measure, and the Sharpe Ratio. In essence, a portfolio was created from each annual class of Supersector Leaders from 2002 through 2012 and compared with the monthly returns of the broad S&P 500. The results of this comparison were then regressed against the returns of the S&P 500 to test the significance of the results at a 95% confidence level.

Third, as a means of comparison, the monthly returns of the DJSI World were compared to the S&P 500 by the same measures and time periods and regressed to test significance at a 95% confidence level.

Finally, the Jensen's Alpha, M-Square, the Treynor Measure, and the Sharpe Ratio of the DJSI World (WISGI) and each annual Supersector Leader class were compared relative to their respective returns against the S&P 500, thereby creating a means to determine whether an individual investor would have achieved greater returns from the DJSI World, the S&P 500, or each annual Supersector Leader class, all else equal, from the inception date of each annual class through March 1, 2013.

### 3.2. Measures of performance<sup>1</sup>

$$\text{Jensen's Alpha: } \alpha_p = r_p - [r_f + \beta_p(r_m - r_f)] \quad (1)$$

$$\text{M-Square: } M^2 = (S_p - S_M) \times \sigma_M \quad (2)$$

$$\text{Treynor's Measure: } T_p = \frac{r_p - r_f}{\beta_p} \quad (3)$$

$$\text{Sharpe's Measure: } S_p = \frac{r_p - r_f}{\sigma_p} \quad (4)$$



Table 1 Tabular demonstration of Cumulative Supersector Leader Portfolio size (2002 to 2012)

Year	Number of companies added	Total number of companies in portfolio
2002	18	18
2003	5	23
2004	5	28
2005	6	34
2006	5	39
2007	5	44
2008	8	52
2009	7	59
2010	4	63
2011	8	71
2012	5	76

Table 1 demonstrates the annual growth of the Cumulative Supersector Leader Portfolio from 2002 to 2012 and specifically shows the number of companies added each year.

### 3.3. Cumulative Supersector Leader portfolio analysis

The second means by which the returns of the DJSI Supersector Leaders were analyzed was by creating a cumulative list of Supersector Leaders and obtaining the monthly returns of each company named since 2002 from the date in which the company was first identified as a Supersector Leader until March 1, 2013. In this way, a cumulative portfolio of companies was created in which all Supersector Leaders are held in a portfolio beginning on each company's respective date of initial pronouncement. The average monthly returns of all companies held in this cumulative portfolio during each given month were then compared with the monthly returns of the S&P 500 (broad market proxy) in terms of Jensen's Alpha, M-Square, the Treynor Measure, and the Sharpe Ratio for the four time periods (1-year, 3-year, 5-year, and the total time period from September 4, 2002 through March 1, 2013). The results of this comparison were then regressed against the returns of the S&P 500 to test the significance of the results at a 95% confidence level. The cumulative holdings of Supersector Leaders are demonstrated in Table 1.

Second, as a means of comparison, the monthly returns of the DJSI World were compared to the S&P 500 by the same measures and time periods and regressed to test significance at a 95% confidence level.

Finally, the Jensen's Alpha, M-Square, the Treynor Measure, and the Sharpe Ratio of the DJSI World (WISGI) and the cumulative Supersector Leader portfolio were compared relative to their respective returns against the S&P 500, thereby creating a means to determine whether an individual investor would have achieved greater returns from the DJSI World, the S&P 500, or the cumulative Supersector Leader portfolio from September 1, 2002 through March 1, 2013, all else equal.

For investors, this methodology would reflect a belief that once a company is named as a Supersector Leader, it remains a leader of corporate sustainability, which is supported by the fact that 44 companies were named as a Supersector Leader more than once from 2002 through 2012 and that 76 companies account for the 203 Supersector Leaders named from 2002 through 2012. Additionally, this methodology allows for reduced transaction costs

compared with the Annual Supersector Leader Portfolio Methodology as the only transactions occurring would be the addition of the approximately 4 to 8 companies named as Supersector Leaders that are not already included in the cumulative portfolio (this does not account for portfolio rebalancing).

#### 4. Results

The results of this study were statistically significant for the Annual Supersector classes from 2002 through 2011. During these years, average annualized monthly returns ranged from 1.73% (2007 Class) to 13.75% (2011 Class) and outperformed the S&P 500 in gross return from 2002 through 2009 and in 2011, with the S&P 500 outperforming the Supersector class in 2010. During this time span, the DJSI World Index was consistently more highly correlated to the returns of the S&P 500, while the Supersector classes had correlation ( $R^2$ ) ranging from 0.22 for the 2002 class to a high of 0.86 for the 2006 class, with a  $\beta$  for each class ranging from 0.87 for the 2004 class to 1.16 for the 2006 class.

For the Cumulative portfolio, from September 2002 through March 2013, the average annual return was 3.68%, comparing favorably to the average annual return of the S&P 500 of 2.11% during this timeframe. This also compares favorably to the return of the DJSI World Index of 2.07%. Once again, the DJSI World Index was more highly correlated with an  $R^2$  of 0.89 against the S&P 500, compared with an  $R^2$  of 0.82 for the Cumulative Supersector Leader portfolio. The  $\beta$  measure for the Cumulative Portfolio during this timeframe was 1.05 against the S&P 500, while the DJSI World Index produced a  $\beta$  measure of 1.12. As discussed in the Methodology, the findings below will be presented using four risk-adjusted measures of return.

##### 4.1. Annual Supersector Leader portfolio

The results of the Annual Supersector Leader Portfolio analysis are presented in Tables 2, 3, 4, and 5. The Jensen's Alpha and M-Square performance measures (represented in Table 2) provide risk-adjusted comparative statistics whereby the performance each annual Supersector class is compared with the baseline market proxy (the S&P 500). It then follows that a positive Jensen's Alpha or M-Square indicates that the Supersector Portfolio outperformed the S&P500 and vice versa. Therefore, it can be interpreted that with 95% significance that the Annual Supersector Leader Portfolio outperformed the S&P500 each year from 2002 through 2008 and underperformed from 2009 to 2011. The 2012 results did not provide a statistically significant indicator of performance.

Second, this portfolio was tested against the S&P500 using Treynor's Measure and Sharpe's Measure, the results of which are shown in Table 3. These risk-adjusted measures for the Supersector Portfolio can be directly compared to the S&P500 baseline, as shown in Table 3, with the higher return representing the better statistical performance. Therefore, it can again be interpreted that with 95% significance that the Annual Supersector Leader

Table 2 Annual Supersector Leader Portfolio performance vs. market proxy (2002 to 2012)

Year	Jensen's	M-Square	Significant at 95%?	<i>p</i> value
2012	0.1476	0.0559	No	0.87
2011	−0.0010	−0.0275	Yes	$2.3 \times 10^{-4}$
2010	−0.0219	−0.0194	Yes	$5.5 \times 10^{-9}$
2009	−0.0077	−0.0088	Yes	$1.3 \times 10^{-14}$
2008	0.0141	0.0111	Yes	$4.4 \times 10^{-22}$
2007	0.0130	0.0118	Yes	$5.1 \times 10^{-27}$
2006	0.0167	0.0140	Yes	$1.1 \times 10^{-34}$
2005	0.0185	0.0184	Yes	$5.1 \times 10^{-37}$
2004	0.0260	0.0245	Yes	$2.7 \times 10^{-22}$
2003	0.0201	0.0174	Yes	$6.8 \times 10^{-27}$
2002	0.0258	0.0210	Yes	$2.7 \times 10^{-8}$

Table 2 demonstrates the annual performance of each Supersector Leader Class Portfolio against the baseline market proxy (S&P 500) using Jensen's Alpha and M-Square as performance measures. Statistical significance of the results is shown in the columns to the far right column, including *p* values, which apply to Jensen's Alpha, M-Square, Treynor's Measure (Table 3), and Sharpe's Measure (Table 3).

Portfolio outperformed the S&P500 each year from 2002 through 2008 and underperformed from 2009 to 2011. The 2012 results once again did not provide a statistically significant indicator of performance.

Third, Tables 4 and 5 also compared the performance of the Annual Supersector Leader Portfolio to the performance of the WISGI, again using the S&P500 as the baseline market proxy.

As demonstrated in Tables 4 and 5, it can be concluded that the Annual Supersector Portfolio outperformed the DJSI in all years on a risk-adjusted basis with 95% statistical significance (with the exception of the 2012 results, which were not statistically significant because of sample size).

Table 3 Annual Supersector Leader Portfolio performance vs. market proxy (2002 to 2012)

Year	Treynor (leaders)	Treynor (S&P 500)	Sharpe (leaders)	Sharpe (S&P 500)
2012	<b>1.4763</b>	0.0755	<b>0.7737</b>	0.4444
2011	0.1121	<b>0.1131</b>	0.3410	<b>0.4503</b>
2010	−0.0012	<b>0.0184</b>	−0.0077	<b>0.1421</b>
2009	0.0072	<b>0.0151</b>	0.0430	<b>0.1028</b>
2008	<b>0.0163</b>	0.0037	<b>0.0790</b>	0.0198
2007	<b>−0.0024</b>	−0.0140	<b>−0.0118</b>	−0.0761
2006	<b>0.0055</b>	−0.0088	<b>0.0298</b>	−0.0512
2005	<b>0.0124</b>	−0.0070	<b>0.0701</b>	−0.0433
2004	<b>0.0248</b>	−0.0051	<b>0.1253</b>	−0.0331
2003	<b>0.0177</b>	−0.0031	<b>0.0955</b>	−0.0211
2002	<b>0.0288</b>	0.0011	0.1478	0.0073

Table 3 demonstrates the annual performance of each Supersector Leader Class Portfolio against the baseline market proxy (S&P 500) using Treynor's Measure and Sharpe's Measure to gauge performance. For the benefit of the reader, the greater return between the Supersector Portfolio and Market Proxy has been bolded.

Table 4 Annual Supersector Leader Portfolio performance vs. WISGI (2002 to 2012)

Year	Jensen's (leaders)	Jensen's (DJSI)	M-Square (leaders)	M-Square (DJSI)	Leaders <i>p</i> value	DJSI <i>p</i> value
2012	<b>0.1476</b>	0.0456	<b>0.0559</b>	0.0199	0.87	0.21
2011	<b>-0.0010</b>	-0.0637	<b>-0.0275</b>	-0.0567	$2.3 \times 10^{-4}$	$1.1 \times 10^{-7}$
2010	<b>-0.0219</b>	-0.0260	<b>-0.0194</b>	-0.0206	$5.5 \times 10^{-9}$	$2.8 \times 10^{-14}$
2009	<b>-0.0077</b>	-0.0222	<b>-0.0088</b>	-0.0190	$1.3 \times 10^{-14}$	$3.4 \times 10^{-19}$
2008	<b>0.0141</b>	-0.0106	<b>0.0111</b>	-0.0090	$4.4 \times 10^{-22}$	$4.9 \times 10^{-29}$
2007	<b>0.0130</b>	-0.0101	<b>0.0118</b>	-0.0078	$5.1 \times 10^{-27}$	$7.7 \times 10^{-34}$
2006	<b>0.0167</b>	-0.0063	<b>0.0140</b>	-0.0048	$1.1 \times 10^{-34}$	$6.2 \times 10^{-39}$
2005	<b>0.0185</b>	-0.0035	<b>0.0184</b>	-0.0025	$5.1 \times 10^{-37}$	$6.8 \times 10^{-44}$
2004	<b>0.0260</b>	-0.0013	<b>0.0245</b>	-0.0008	$2.7 \times 10^{-22}$	$4.1 \times 10^{-49}$
2003	<b>0.0201</b>	-0.0005	<b>0.0174</b>	-0.0002	$6.8 \times 10^{-27}$	$2.5 \times 10^{-55}$
2002	<b>0.0258</b>	-0.0005	<b>0.0210</b>	-0.0005	$2.7 \times 10^{-8}$	$3.8 \times 10^{-62}$

Table 4 demonstrates the annual performance of each Supersector Leader Class Portfolio against the Dow Jones Sustainability Index (WISGI), while utilizing the S&P 500 as the baseline market proxy. Performance measures in Table 5 are Jensen's Alpha and M-Square. Statistical significance of the results is shown in the columns to the far right column, including *p* values that apply to Jensen's Alpha, M-Square, Treynor's Measure (Table 5), and Sharpe's Measure (Table 5). For the benefit of the reader, the greater return between the Supersector Portfolio and WISGI has been bolded.

#### 4.2. Cumulative Supersector Leader portfolio analysis

The results of the Cumulative Supersector Leader Portfolio analysis are presented in Tables 6, 7, 8, and 9. For the Cumulative Supersector Portfolio analysis, the Jensen's Alpha and M-Square performance measures were once again utilized to provide risk-adjusted comparative statistics whereby the performance of each annual Supersector class is compared with the baseline market proxy (the S&P 500). It then follows that a positive Jensen's Alpha or M-Square indicates that the Supersector Portfolio outperformed the S&P500 and vice versa. Therefore, it can be inter-

Table 5 Annual Supersector Leader Portfolio performance vs. WISGI (2002 to 2012)

Year	Treynor (leaders)	Treynor (DJSI)	Sharpe (leaders)	Sharpe (DJSI)
2012	<b>1.4763</b>	0.1590	<b>0.7737</b>	0.5613
2011	<b>0.1121</b>	0.0616	<b>0.3410</b>	0.2245
2010	<b>-0.0012</b>	-0.0024	<b>-0.0077</b>	-0.0176
2009	<b>0.0072</b>	-0.0042	<b>0.0430</b>	-0.0265
2008	<b>0.0163</b>	-0.0055	<b>0.0790</b>	-0.0281
2007	<b>-0.0024</b>	-0.0230	<b>-0.0118</b>	-0.1183
2006	<b>0.0055</b>	-0.0144	<b>0.0298</b>	-0.0789
2005	<b>0.0124</b>	-0.0101	<b>0.0701</b>	-0.0587
2004	<b>0.0248</b>	-0.0063	<b>0.1253</b>	-0.0383
2003	<b>0.0177</b>	-0.0036	<b>0.0955</b>	-0.0228
2002	<b>0.0288</b>	0.0006	0.1478	0.0041

Table 5 demonstrates the annual performance of each Supersector Leader Class Portfolio against the Dow Jones Sustainability Index (WISGI), while utilizing the S&P 500 as the baseline market proxy. Performance measures in Table 5 are Treynor's Measure and Sharpe's Measure. For the benefit of the reader, the greater return between the Supersector Portfolio and WISGI has been bolded.

Table 6 Cumulative Supersector Leader Portfolio performance vs. market proxy (2002 to 2012)

Investment period	M-Square (leaders)	Jensens (leaders)	Significant at 95%?	<i>p</i> value
September 2002 to March 2013 (total)	0.0135	0.0156	Yes	$5.1 \times 10^{-48}$
September 2002 to September 2003 (1-Year)	-0.0086	-0.0078	Yes	$8.2 \times 10^{-8}$
September 2002 to September 2005 (3-Year)	0.0125	0.0149	Yes	$2.0 \times 10^{-14}$
September 2002 to September 2007 (5-Year)	0.0184	0.0253	Yes	$1.2 \times 10^{-14}$

Table 6 demonstrates the performance of the Cumulative Supersector Leader Class Portfolio against the baseline market proxy (S&P 500) using Jensen's Alpha and M-Square as performance measures. The investment periods for this analysis are detailed in the far left column. Statistical significance of the results is shown in the columns to the far right column, including *p* values which apply to Jensen's Alpha, M-Square, Treynor's Measure (Table 7), and Sharpe's Measure (Table 7).

preted that with 95% significance the Cumulative Supersector Leader Portfolio outperformed the S&P500 in the 3-Year, 5-Year, and 11-Year Maximum Investment Periods, and underperformed the S&P-500 in the 1-Year Investment Period from 2002 to 2003.

Second, this portfolio was also tested against the S&P500 using Treynor's Measure and Sharpe's Measure, the results of which are shown in Table 7. These risk-adjusted measures for the Supersector Portfolio can be directly compared with the S&P500 baseline, as shown

Table 7 Cumulative Supersector Leader Portfolio performance vs. market proxy (2002 to 2012)

Investment period	Treynor (leaders)	Treynor (S&P 500)	Sharpe (leaders)	Sharpe (S&P 500)
September 2002 to March 2013 (total)	<b>0.0160</b>	0.0011	<b>0.1243</b>	0.0073
September 2002 to September 2003 (1-Year)	0.0336	<b>0.0414</b>	0.2128	<b>0.2686</b>
September 2002 to September 2005 (3-Year)	<b>0.0368</b>	0.0214	<b>0.3064</b>	0.1936
September 2002 to September 2007 (5-Year)	<b>0.0445</b>	0.0177	<b>0.3730</b>	0.1831

Table 7 demonstrates the performance of the Cumulative Supersector Leader Class Portfolio against the baseline market proxy (S&P 500) using Treynor's Measure and Sharpe's Measure the gauge performance. The investment periods for this analysis are detailed in the far left column. Statistical significance of the results is shown in the far right column. For the benefit of the reader, the greater return between the Supersector Portfolio and Market Proxy has been bolded.

Table 8 Cumulative Supersector Leader Portfolio performance vs. WISGI (2002 to 2012)

Investment period	M-Square (leaders)	M-Square (DJSI)	Jensens (leaders)	Jensens (DJSI)	Leaders <i>p</i> value	DJSI <i>p</i> value
September 2002 to March 2013 (total)	<b>0.0135</b>	-0.0005	0.0156	-0.0005	$5.1 \times 10^{-48}$	$3.8 \times 10^{-62}$
September 2002 to September 2003 (1-Year)	-0.0086	<b>0.0018</b>	-0.0078	<b>0.0033</b>	$8.2 \times 10^{-8}$	$1.6 \times 10^{-7}$
September 2002 to September 2005 (3-Year)	<b>0.0125</b>	0.0064	<b>0.0149</b>	0.0081	$2.0 \times 10^{-14}$	$7.1 \times 10^{-20}$
September 2002 to September 2007 (5-Year)	<b>0.0184</b>	0.0094	<b>0.0253</b>	0.0117	$1.2 \times 10^{-14}$	$2.7 \times 10^{-27}$

Table 8 demonstrates the performance of the Cumulative Supersector Leader Class Portfolio against the Dow Jones Sustainability Index (WISGI), while utilizing the S&P 500 as the baseline market proxy. Performance measures in Table 8 are Jensen's Alpha and M-Square. Statistical significance of the results is shown in the columns to the far right column, including *p* values that apply to Jensen's Alpha, M-Square, Treynor's Measure (Table 9), and Sharpe's Measure (Table 9). For the benefit of the reader, the greater return between the Supersector Portfolio and WISGI has been bolded.



Table 9 Cumulative Supersector Leader Portfolio performance vs. W1SGI (2002 to 2012)

Investment period	Treynor (leaders)	Treynor (DJSI)	Sharpe (leaders)	Sharpe (DJSI)
September 2002 to March 2013 (total)	<b>0.0160</b>	0.0006	<b>0.1243</b>	0.0073
September 2002 to September 2003 (1-Year)	0.0336	<b>0.0445</b>	0.2128	<b>0.2806</b>
September 2002 to September 2005 (3-Year)	<b>0.0368</b>	0.0290	<b>0.3064</b>	0.2513
September 2002 to September 2007 (5-Year)	<b>0.0445</b>	0.0177	<b>0.3730</b>	0.2798

Table 9 demonstrates the performance of the Cumulative Supersector Leader Class Portfolio against the Dow Jones Sustainability Index (W1SGI), while utilizing the S&P 500 as the baseline market proxy. Performance measures in Table 9 are Treynor's Measure and Sharpe's Measure. For the benefit of the reader, the greater return between the Supersector Portfolio and W1SGI has been bolded.

in Table 7, with the higher return representing the better statistical performance. Therefore, these measures confirm the results of the Jensen's Alpha and M-Square measures in finding that with 95% significance the Cumulative Supersector Leader Portfolio outperformed the S&P500 in the 3-Year, 5-Year, and 11-Year Maximum Investment Periods, and underperformed the S&P-500 in the 1-Year Investment Period from 2002 to 2003.

Finally, Tables 8 and 9 also compared the performance of the Cumulative Supersector Leader Portfolio to the performance of the W1SGI, again using the S&P500 as the baseline market proxy.

As is demonstrated in Tables 8 and 9, it can be concluded that the Cumulative Supersector Portfolio outperformed the Dow Jones Sustainability Index in the 3-Year, 5-Year, and 11-Year Maximum Investment Periods, and underperformed the DJSI in the 1-Year Investment Period from 2002 to 2003.

## 5. Interpretation of results

These results, which show statistically significant superior returns to the market (on a risk adjusted basis) over longer term periods, are consistent with the supposition that stocks of sustainable firms would show most benefits over a long-term time horizon.

The results of this study point to a potential inefficiency as the market may not fully understand how to incorporate the effects of sustainability practices into securities pricing. These results also indicate that an investor could have achieved above-average returns by investing in sustainability leaders over the last 10 years based on this inefficiency. Such information could provide an incentive and positive market pressure to be a leader in sustainability, which would provide newfound energy and headwinds in the sustainability movement, which has previously been driven through disincentives and regulation. Such positive market pressure is also a more economically efficient means of effecting change in the market and in the allocation of supply and demand.

For investors with an inclination to invest in or reward sustainable businesses, this study provides a comparison of active versus passive strategies as well as a potential blueprint for achieving competitive or even above-average returns. The data in this study demonstrate that investments in sustainability leaders over the last 10 years has been profitable compared with the broad market, but has vastly outperformed sustainability indexes over the same time period, which utilize a lesser degree of selectivity than the sample portfolios of Supersector Leaders.

## 6. Summary and conclusions

Our results shed additional light on the ongoing debate over whether an investor can “do well by doing good.” Moreover, the results provide information regarding not only “if” sustainable investing is rewarded, but also “how” this financial payoff would have been earned in the past decade when selecting sustainable firms stocks.

We find that an investor *can* achieve superior financial returns by actively selecting sustainable firm stocks, and that the method of firm selection does have impact, judging by the performance of sustainable firm equity investments over the 2002–2012 period. By measuring financial performance based on the risk-adjusted stock returns of two distinct groups of sustainable firms, our analysis reveals that DJSIs Supersector Leaders outperformed the overall market on this basis. Alternatively, the WISGI underperformed the broader market over the period studied.

The nuances of the approach taken may explain why these results yield new insights into how investors might increase the likelihood that a sustainable investing strategy would reap financial rewards. First, we measure financial payoff using four, comprehensive return metrics that all measure a portfolio’s success by simultaneously considering stock returns and the level of risk taken to earn those returns.

Prior work has hypothesized that firms embracing sustainable business practices are comparatively more successful financially, either because they earned higher returns, or were seen by markets as having lower risk. Therefore, by including all of these measures, we were able to check the results for consistency since each metric considers a different aspect of overall corporate risk. All four yielded consistent results: A portfolio comprised of companies identified as sustainability leaders would have earned an investor superior returns during the period studied.

A second nuance of our approach was the separation of the 10-year performance of the sustainability portfolios into subperiods/time “buckets” to help determine any relevance of shorter- versus longer-term investment horizons for sustainable investors. These results, which show statistically significant superior returns to the market (on a risk adjusted basis) over longer term periods, are consistent with the supposition that stocks of sustainable firms would show most benefits over a long-term time horizon, and may not earn abnormally high returns for short-term focused investors. In other words, embracing sustainable business practices is a long-term, value-maximizing strategy.

## Notes

- 1 See Bodie, Kane, and Marcus (2014), pp. 837–847.

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