Analysing sustainable securities

Building a portfolio of global investments based solely on their sustainable characteristics may not be enough say **JOHN EVANS**, **RON GUIDO** and **MARIA GUO**. Investors also need to look at risk factors such as country, industry size and book to market.

Interest in investments selected for their ethical or sustainable characteristics has seen strong worldwide growth in recent years. Historical research of the impact of adopting a sustainable strategy on investment performance has concentrated on the analysis of the returns of sustainable or ethical mutual funds performances with no clear result.

There are several problems with the historical research: firstly, by default, the analysis usually has not controlled for mandate restrictions; secondly, the analysis has looked at nominal return only in most instances, i.e. it did not consider causes of the return; and thirdly, the analysis was looking for value added, whereas it is reasonable to say that if investors found that sustainable investment criteria was unlikely to result in lower returns, then given the other benefits to society, the result would be acceptable.

Our research has therefore controlled for portfolio construction issues, other causes of security performance than sustainability, and concentrated on determining if there was evidence of underperformance.

PREVIOUS ANALYSIS

The Table 1 analyses the results of the literature over the prior 25 years that considered the relationship between corporate social performance (CSP), which broadly corresponds to our sustainable characteristics, and corporate financial performance (CFP).

Research into the performance of ethical portfolios generally has involved measuring the risk and return compared with a benchmark such as the S&P 500 broad market index, but there have been problems with the historical analysis. Firstly, the ethical criteria of different investors can vary enormously and secondly, different approaches have been employed to measure the financial performance of ethical assets, and different benchmarks have been used.

As well, other factors such as the skill of the active fund manager and the period over which performance was measured may also influence the performance evaluation of ethical investments. Mallin, Saadouni and Briston (1995) matched the performance of ethical trusts to non-ethical trusts based on fund size and date of formation. This process eliminated specific characteristics existing in ethical portfolios such as a small firm effect and short life of these funds.

Some ethical funds and non-ethical funds outperformed the market, with the majority having positive and significant alphas. However, on a risk-

TABLE 1 COMPARISON OF RELATIONSHIP BETWEEN CSP AND CFP

Period	Positive relationship	Inconclusive	Negative relationship
1970s	12/17	4/17	1/17
1980s	14/35	5/35	16/35
1990s	7/10		3/10

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adjusted basis, both ethical and non-ethical funds under-performed the market with ethical funds weakly outperforming the non-ethical funds. Gregory, Matatko and Luther (1997) also found that after controlling for a size selection bias in the ethical portfolios, both ethical and non-ethical trust funds under-performed the general market.

In contrast to Mallin, Saadouni and Briston (1995), they showed ethical funds had a lower alpha than non-ethical funds.[1] Bauer, Koedijk and Otten (2002) applied a multifactor Carhart (1997) model to measure the performance of ethical funds. After controlling for the investment style, the study found little evidence of significant differences in risk-adjusted returns between ethical and conventional funds.

More recently, Edwards and Samant (2003) applied a new risk-adjusted factor, the M-Squared factor, that adjusted the investment of a mutual fund to the level of risk in an unmanaged benchmark stock market index, and measured the return on the risk-matched fund.[2]

This method related the level of risk to level of reward, and after risk adjustment, found the Domini Social Index (DSI)[3] portfolio outperformed the market given the same level of risk.

Another recent development in performance measurement, suggested by Basso and Funari (2002), is the use of Data Envelopment Analysis (DEA) to evaluate ethical mutual funds.[4]

This method permits the comparison on the basis of fund return and risk, and on the basis of investment costs such as subscription costs and redemption fees.

The choice of benchmarks has also been an issue in the analysis. The introduction of the Domini Social Index (DSI) in 1990 offered a benchmark for ethical investments that specifically included an ethical filter in the benchmark construction. Composition of the DSI is only affected by changes in social concerns and by changes in investment policy, rather than responding to a changing market.

Statman (2000) found that a DSI portfolio performed as well as the S&P500 index over the period of 1990–1998, while ethical mutual funds under-performed both the market and DSI but not worse than conventional mutual funds.

The inconsistencies in the findings can be attributed to the use of different samples from multiple industries or different sources of data, as well as the multiple dimensions used to measure financial performances where researchers have inconsistently used one or only a few measures to assess financial performance.

OUR METHODOLOGY

The methodology we have employed involved:

- Obtaining a database of securities that were selected solely for their ethical characteristics; and
- Analysis of the possible causes of returns for the universe of securities that we obtained.

A unique set of data has been obtained for global stocks that were selected for their satisfactory grading with respect to internal policies, social policy, economic policy and environmental policy by Ethibell, a research organisation that specialises in the screening and selection of sustainable securities for fund managers.

Ethibell selected the securities in the analysis for their sustainable universe of international securities based on Ethibell's assessment of the corporation's practice and attitude to:[5]

- Internal social policy (terms of employment, working conditions, industrial relations);
- External social policy (societal impact, communication, human rights policies, social investments, developing countries policy);
- Economic policy (economic potential, policies to customers, shareholders, authorities, suppliers); and
- Environmental policy (strategy, management process, production policy and products developed).

SUMMARY STATISTICS

Data was provided in the form of the list of stocks selected by Ethibell, their

TABLE 2 SUMMARY STATISTICS FOR SUSTAINABLE SECURITIES

Ethical Securities Monthly Returns (%)	
Mean	0.0052
Standard Error	0.0090
Median	0.0058
Sharpe Ratio	0.0317
Standard Deviation	0.0690
Kurtosis	-0.7208
Skewness	-0.1782

TABLE 3 SUMMARY STATISTICS FOR BENCHMARKS

Returns (%)	MSCI Country Index Monthly Returns	MSCI Sector Index Monthly Returns
Mean	-0.0029	-0.0073
Standard Error	0.0068	0.0196
Median	-0.0065	-0.0426
Sharpe Ratio	-0.1125	-0.0687
Standard Deviation	0.0526	0.1512
Kurtosis	-0.2772	0.3687
Skewness	0.0120	0.2278

total returns in local currency while held in the portfolio, corresponding MSCI sector and industry group total returns, and currency values relative to the USD.

There were in total 109 stocks in the universe, however in this research we only used 97 stocks due to insufficient data for the remainder for a sufficiently long period. Additional information on stock prices in terms of USD, market value, price to book ratio, country of operation, as well as industry sector were obtained from DataStream for a period of 60 months (July 1998 to June 2003). All analysis was carried out in USD.

Table 2 reports the summary statistics and indicates that the returns of the sustainable securities were not normally distributed with a slight skewed distribution to the left.[6] For the purpose of comparison, summary statistics are also provided for MSCI country indices and MSCI sector indices in Table 3.

The summary statistics show that the average returns of the sustainable assets were greater than both the country and sector benchmarks. The Sharpe Ratio of the ethical portfolio constructed by market capitalisation weighting of the ethical assets is also greater than the Sharpe Ratio for the MSCI portfolios, which implies that the ethical portfolio offers greater reward to variability. However, none of the average returns are significantly different to zero.

FACTOR ANALYSIS

We examined whether the performance of sustainable assets could be accounted for by other determinable risk factors. This was achieved by utilising a Fama French (1993) 3-factor model. In constructing these factor models, a series of testing procedures were adopted including the MLE tests developed by Gibbons, Ross and Shanken (1989), and the GMM based test statistics of MacKinlay and Richardson (1991). In addition, an inequality test based on the results of Kodde and Palm (1986) was also applied to test the sign of the ethical assets' abnormal returns generated by these factor models.

We followed the methodology of Fama and French (1993), and Black, Jensen and Scholes (1972) in identifying five common risk factors in the returns on stocks and bonds, which included: the overall market factor, SMB, HML and 2 bond market factors, viz, maturity and default risk. This analysis resulted in the formation of 6 portfolios (Small Value, Medium Value, Big Value, Small Growth, Medium Growth and Big Growth) for each of the 17 markets (a total of 102 portfolios every month), which were tracked over the period of July 1998 to June 2003.

These portfolios then formed the basis of the factor mimicking portfolios, SMB and HML. With the domestic excess market returns SMB and HML portfolios formed, global factors were constructed by value weighting each of the domestic risk factors according to their MSCI country index market value. Three types of test statistics were utilised in this factor analysis. These were the finite sample GRS test introduced by Gibbons, Ross and Shanken (1989), the Wald test under the GMM framework by MacKinlay and Richardson (1991), using small sample corrected p-values by bootstrapping the test statistic as shown in Fisher and Sim (1995), and an alpha inequality test outlined in Boudoukh, Richardson and Smith (1993).

The Fama and French 3-factor model tests the hypothesis that alpha is significantly different to zero. However, we were also interested to establish if the alpha was significantly less than zero, and hence, an inequality alpha test is applied following the procedure outlined in Wolak (1989) and Boudoukh, Richardson and Smith (1993).[7]

Table 4 lists the number of sustainable securities that rejected the null hypothesis that abnormal performance is not significantly different from zero when using domestic factors. It also compares the number of stocks rejected and the total number of stocks listed beside each country, as well as the percentage of stocks being rejected for each relevant country.

Overall, this study would suggest that:

- Sustainable securities do not have an expected return cost to investors; and
- When constructing portfolios, investors do need to consider risk factors other than just "ethical" issues.

TABLE 4 COUNTRIES AGAINST DOMESTIC FAMA FRENCH FACTORS

The percentage is the number of rejections divided by the total number of stocks in that country.

Country	Number of rejections	Percentage
DKK (4)	1	25.00%
BEF (4)	3	75.00%
FIM (2)	0	0.00%
DEM (15)	5	33.33%
GBP (10)	2	20.00%
ITL (2)	1	0.00%
CHF (3)	0	0.00%
ESP (2)	0	0.00%
NOK (1)	0	0.00%
FRF (3)	0	0.00%
SEK (1)	0	0.00%
NLG (2)	1	50.00%
JPY (11)	1	9.09%
AUD (3)	0	0.00%
NZD (1)	0	0.00%
USD (27)	9	33.33%
CAD (6)	4	66.67%

This research also has a number of practical applications for pension funds and other institutional investors. Pension funds in particular, have obligations to members to make investments that do not offer compensating expected return for risk. The findings from this research imply that investors can now feel assured that sustainable securities are not inferior investments, and should not significantly underperform the broader market, but securities should not be selected on sustainable characteristics alone.

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Notes

[1] Carhart (1997) model is a four-factor model where size, book to market, momentum and time variation in betas are controlled.

[2] See Modigliani F., and Modigliani L., (1997), "Risk-Adjusted Performance" *Journal of Portfolio Management*" Vol. 23; No. 2, pp. 45–54 for more details on the M-Squared factor.

[3] DSI is a well-diversified portfolio of socially screened securities that reflect mainstream social concerns. DSI excludes firms engaged in the manufacture of alcohol or tobacco, gambling, military weapons, nuclear power and business ties to South Africa. DSI was constructed by applying social screens to firms in the S&P 500, selected firms with exceptional social and financial performance, and adjusts for the potential negative side effects associated with implementation of socially responsible investment.

[4] See Basso and Funari (2002) for more details on DEA.

[5] For more details on the selection criteria, please see www.ethibel.be

[6] Skewness is defined as a measure of the lack of symmetry in a distribution. A normal distribution has a value near zero; a positive skew has a positive value higher than zero; a negative skew has a negative value. Kurtosis is defined as a measure of the degree of peakedness in the distribution. Normal distributions have a value near zero; flat distributions have a negative value; peaked distributions have a positive value.

[7] See Boudoukh, Richardson and Smith (1993) for derivation details.