Do green mutual funds perform well? (2012)

C. Edward Chang, Walt A. Nelson and H. Doug Witte

University of BRISTOL

Purpose of the paper

- Paper addresses the following issue: do green mutual funds perform as well as the averages of all mutual funds in their respective categories?

- paper examines operating characteristics and performance measures of all available green mutual funds in the USA over the last 15 years as of March 31, 2011

Previous empirical studies on SRI are typically one of three types:

1. The first type focuses on the performance of a social index, such as the Domini Social Index (Corson and Van Dyck, 1992; Statman, 2000).

2. Second type analyses social responsibility at the firm level, sorting individual stocks into portfolios based on a number of social criteria (Diltz, 1995).

3. Third type focuses on the performance of socially responsible investment vehicles – mutual funds and ETFs

This study analysis fits into third group in terms of similar focus on the return performance of green equities at the fund level.

Literature review

- Green investing is a relatively new subset of socially responsible investing (SRI); no formal definition of green investing

- Keefe (2007) defines sustainable investing as the integration of ESG factors into financial analysis and decision making, and argues that sustainable investing and socially responsible investing are different

- Investments considered by socially responsible funds (SRFs) may be positively screened for inclusion based on criteria such as environmental responsibility, employee relations, or product safety.

- Funds may also be negatively screen for exclusion based on a company's involvement in promoting, for example, alcohol, tobacco, gambling, or involvement in the defence industry.

- Rudd (1981) argues that the loss of diversification introduced by social screens increases a screened portfolio's covariation in returns unrelated to the market. Thus, the loss of diversification is unlikely to be offset by an increase in returns, resulting in lower

- Sharpe (1965) demonstrates that portfolios formed using a subset of all available investments cannot have a higher return per unit of risk profile than portfolios formed using all available investments

Previous studies

- Mallett and Michelson (2010) find that green fund returns are similar to index returns. They also find little return difference between green funds and SRFs. The number of green funds in their paper ranges from <u>four to six</u>, depending on the time frame analysed.

- Sabbaghi (2010) studied <u>15 green funds </u>from 2005 to October 2009. He documents that green returns were quite good until the autumn of 2008, at which time the average fund lost around 70 percent of its value. Unfortunately, the returns are not benchmarked to any index, so it difficult to gauge how they compare to average stock returns over any period.

Contribution of this paper to previous studies

- This paper analyses <u>131 </u>green mutual funds and has a balanced analysis of risk and return, providing a more comprehensive view of green investing.

Empirical Analysis

- study analyses all green mutual funds in the USA having at least three-year data available as of March 31, 2011

- green mutual funds identified by US SIF

- US SIF define green mutual funds as mutual funds that seek investments with positive impact in at least one of the three areas (climate/clean tech, pollution/toxics, environment/other)

- data for individual green mutual funds and category averages of mutual funds were collected from Morningstar's Principia database

Morningstar category	With three-year data		With five-year data		With ten-year data		With 15-year data	
	Green MFs	All MFs	Green MFs	All MFs	Green MFs	All MFs	Green MFs	All MFs
Equity energy	3	72						
Foreign large blend	5	728	2	538	2	306		
Foreign large value	7	290	5	221	5	136	5	n.a.
Foreign small/mid growth	4	121						
Large blend	23	1,757	23	1,471	21	816	11	n.a.
Large growth	20	1,505	18	1,312	18	818	10	n.a.
Large value	5	1,120	5	945				
Mid-cap blend	2	380	2	304	2	185	2	n.a.
Mid-cap growth	9	682	5	603	4	401	4	n.a.
Mid-cap value	1	361						
Small blend	3	577	3	487				
Small growth	7	687	2	566				
Utilities	1	84	1	78	1	52	1	n.a.
World stock	7	660	4	502	4	279	2	n.a.
Aggressive allocation	2	226	2	182	2	69	2	n.a.
Moderate allocation	11	932	11	734	8	408	7	n.a.
Conservative allocation	2	592	2	442				
High yield bond	3	506	3	430	3	288		
Intermediate-term bond	11	1,021	11	873	11	563	5	n.a.
Total of equity categories	97	9,024	70	7,027	57	2,993	35	n.a.
Total of all categories	126	12,301	99	9,688	81	4,321	49	n.a.

Notes: MFs – mutual funds; n.a. – not available to the authors

- primary statistical testing method used in this paper is a paired t-test for means
- Each category of funds has one measurement which is aggregated across all fund categories, but not across different time periods to avoid double counting*
- Performance measures include conventional return, risk, and risk-adjusted return
- Operating characteristics include expense ratios, annual turnover rates, and tax cost ratios.

Morningstar category	Expense ratio (%)		Annual turnover (%)		Tax cost ratio (%)	
	Green MFs	AMFs	Green MFs	AMFs	Green MFs	AMFs
Equity energy	2.03	1.84	73.00	91.00	0.00	0.63
Foreign large blend	1.49	1.37	53.40	78.00	0.45	0.85
Foreign large value	1.89	1.39	119.29	64.00	0.52	1.04
Foreign small/mid growth	1.69	1.63	44.00	76.00	0.23	0.58
Large blend	1.16	1.12	42.48	73.00	0.37	0.54
Large growth	1.34	1.31	32.90	86.00	0.22	0.16
Large value	1.06	1.26	34.40	57.00	0.46	0.62
Mid-cap blend	1.12	1.34	40.50	88.00	0.52	0.30
Mid-cap growth	1.96	1.42	205.92	102.00	0.48	0.16
Mid-cap value	1.24	1.36	61.00	76.00	0.41	0.43
Small blend	1.77	1.39	174.00	71.00	0.01	0.35
Small growth	1.26	1.52	103.25	113.00	0.49	0.11
Utilities	1.92	1.41	53.00	137.00	0.39	1.38
World stock	1.30	1.49	62.57	74.00	0.31	0.59
Aggressive allocation	0.84	0.87	36.00	49.00	0.70	0.84
Moderate allocation	1.46	1.01	37.36	75.00	0.44	0.91
Conservative allocation	1.06	0.86	9.00	48.00	1.01	1.20
High yield bond	0.99	1.18	70.00	89.00	3.07	2.88
Intermediate-term bond	1.04	0.94	54.82	221.00	1.35	1.67
Average of equity categories	1.52	1.42	78.55	84.71	0.35	0.55
t-test (probability)	0.111		0.342		0.032**	
Average of all categories	1.40	1.30	68.78	87.79	0.60	0.80
t-test (probability)	0.061*		0.092*		0.010**	

Notes: Significant at: *0.10, **0.05 and ***0.01 levels; MFs – mutual funds; AMFs – (category) average of mutual funds

*the highest (lowest) expense ratio is the same as the category of the all-mutual funds group with the highest (lowest) expense ratio

Empirical results

Green mutual funds have:

- higher expense ratios in 12 of the 19 categories than category averages

- lower turnover rates in 16 of the 19 categories than category averages

- lower tax cost ratios in 14 of the 19 categories than category averages

Morningstar category	Expense ratio (%)		Annual turnover (%)		Tax cost ratio (%)	
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- generally, underperform in terms of return
- as a whole, have lower returns than the category averages over 5 and 10 year period
- Results over the three- and 15-year periods are inconclusive
- few categories do outperform
- Results of return percentile rank in category are similar
- lower Sharpe ratios over 5 and 10 year period
- betas (market risk) similar to the category averages over all time periods
- alphas (market-risk-adjusted excess returns) lower over all time periods

Morningstar category	Three year Green MFs	AMFs	Five year Green MFs	AMFs	Ten year Green MFs	AMFs	15 Year Green MFs	AMFs
Equity energy	−18.25	0.34						
Foreign large blend	−2.31	−2.74	−0.21	1.33	2.10	5.01		
Foreign large value	−7.34	−3.25	−3.73	0.90	1.62	5.99	2.34	6.55
Foreign small/mid growth	−1.74	0.98						
Large blend	2.76	1.98	2.29	2.13	3.69	3.28	7.16	6.44
Large growth	3.00	3.57	1.79	3.08	3.59	2.91	7.37	6.33
Large value	0.77	1.29	0.37	1.65				
Mid-cap blend	10.05	6.42	4.44	3.98	7.74	7.61	10.99	8.59
Mid-cap growth	11.98	6.68	3.60	4.32	2.42	5.91	5.69	7.97
Mid-cap value	16.39	6.39						
Small blend	5.29	8.02	2.28	3.13				
Small growth	6.01	8.77	−4.30	3.56				
Utilities	2.88	−0.38	5.85	5.32	2.95	3.93	7.62	7.80
World stock	0.23	0.78	2.18	2.68	4.65	5.25	6.17	6.92
Aggressive allocation	2.23	2.94	2.95	3.10	4.06	4.93	7.45	6.81
Moderate allocation	2.37	3.53	2.33	3.55	2.56	4.36	4.94	6.27
Conservative allocation	2.94	4.27	3.30	4.07				
High yield bond	8.58	9.69	7.31	6.86	6.63	6.85		
Intermediate-term bond	4.46	5.63	5.05	5.50	4.98	5.15	5.59	5.60
Average of equity categories	2.12	2.78	1.32	2.92	3.60	4.99	6.76	7.23
t-test (probability)	0.355		0.031 **		0.041 **		0.299	
Average of all categories	2.65	3.42	2.22	3.45	3.92	5.10	6.53	6.93
t-test (probability)	0.273		0.019 **		0.014 **		0.260	

Notes: Significant at: *0.10, **0.05 and ***0.01 levels; MFs – mutual funds; AMFs – (category) average of mutual funds

Average annual return (%)

What my plan is

- Build on the work of Edward, Walt and Doug from 2012

- Perhaps learn more about the way in which green fund returns are generated, multiple factor models