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ESG Ratings and the Performance of Socially Responsible Mutual Funds: A Panel Study

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Abstract

This study uses the Fama-French 5-factor model to examine the risk-adjusted performances of Socially Responsible Mutual Funds (SRMF) relative to the market over a 12-year (2005–2016) period. The timeframe of this study overlaps the periods leading up to, during, and immediately past the Great Recession. This study also examines whether the Environmental, Social, and Governance (ESG) ratings assigned to the SRMF signal fund performance over time. The results indicate that although the SRMF underperformed in the market during the 2005–2016 period, there was no difference in the SRMF performance with respect to the market during the Great Recession period. Furthermore, our results indicate that the SRMF with higher ESG ratings outperformed the SRMF with lower ESG ratings during the Great Recession period. Implications of this study's findings for investment analysts, portfolio managers, and financial planners are included.

I. Introduction

According to USSIF (2016), investment in US-domiciled socially responsible mutual funds (SRMF) has grown substantially over the previous two decades. The number of SRMF available in the market has increased by 33% over the past two years. This rapid growth in the number of funds available has been accompanied by an increase in the amount of assets under management, which reached $8.72 trillion in 2016. SRI funds provide investors with the opportunity to participate in the market while investing in portfolios comprising corporations that value those socially responsible causes that are important to the investors (Haigh & Hazelton, 2004). The SRMF are expected to outperform conventional funds because they comprise corporations that demonstrate corporate social responsibility (CSR) and transparency in their operations (Renneboog et al., 2008). The principal idea behind this hypothesized increased performance is that the portfolios of these funds include responsibly managed and administratively transparent corporations that make sustainable and safe products. As a result, the responsible practices followed by the corporations included within the SRMF portfolios are expected to have lower risks and liabilities arising from class-action lawsuits or other related penalties that can negatively affect the companies' corporate earnings (Guerard, 1997). Nofsinger and Varma (2012), after controlling for the 4-factor Carhart model, found that although SRMFs trailed the conventional funds during the non-crisis periods, SRMFs outperformed other conventional funds during periods of market crisis.

According to Rathner (2013), US-domiciled SRMF have performed better than the non-US SRMF. Although some studies have compared the performance of SRMF to the market, very few studies have compared the funds' performances within the SRMF universe (Margolis & Walsh, 2003; Orlitzky et al., 2003; Tosun, 2017). Further, no study was found to be available in the extant literature that has examined the performance of SRMF based on their ESG ratings before, during, and after the Great Recession. This study therefore adds to the body of literature by comparing the performances of SRMF based on the assigned Environmental, Social, and Governance (ESG) ratings in addition to examining the SRMF performances relative to the market leading up to, during, and after the Great Recession. This study examines whether SMRF ESG ratings translate into higher risk-adjusted returns after controlling for other fund related characteristics.

II. Literature Review

In one of the seminal papers on SRMF, Hamilton, Jo, and Statman (1993) examined three different hypotheses when comparing the performances of socially responsible portfolios to the portfolios of conventional funds: 1) The socially responsible mandates are not associated with market risk and should not affect portfolio returns when compared with the conventional funds; 2) The expected returns of socially responsible funds should be lower than the expected returns of conventional funds because socially responsible corporations are already priced in the market; 3) The returns of socially responsible funds should be higher than the returns for conventional funds if the investors in general underestimate the probability of negative consequences for socially irresponsible corporation performance. The authors found no significant differences between the performance of SRMF and conventional funds. Hamilton, Jo, and Statman's (1993) paper was among the first to find that investors are not penalized for investing in socially responsible companies. In the UK, Mallin, Saadouni, and Briston (1995) compared the portfolio performance of 'ethical' corporations against the portfolios of non-ethical corporations and the benchmark index. They found that 'ethical' portfolios do not outperform the market. Similarly, Cortez, Silva, and Areal (2009) found that SRMF performances in the European markets are not significantly different than the performances of conventional funds; moreover, the returns of conventional indices have a higher explanatory power than the socially responsible indices when predicting SRMF performance. Similarly, no statistical difference in the performances of SRMF and conventional funds were found in the context of the Australian and Canadian markets (Bauer et al., 2005, 2007).

Tosun (2016) found that adding corporations with higher scores in CSR to the SRMF portfolio does not improve portfolio performance, and funds with greater sensitivity to the corporate socially responsible stocks underperformed in the market. On the contrary, the studies by Margolis and Walsh (2003) and Orlitzky et al. (2003) showed that greater portfolio allocation to stocks of corporations that showed greater CSR were associated with better financial performance. Other studies that have compared the performance of SRI indices with conventional market indices after removing the companies with low social records have found that the

performances of social indices are similar to the performances of broad market indices (Grossman & Sharpe, 1986; Sauer, 1997; Statman, 2006).

To summarize the findings from previous studies, the researchers found no significant difference between the performance of SRMF and the conventional funds, and the SRMF and conventional funds generally underperform the benchmark indices on a risk-adjusted basis (Bauer et al., 2005, 2007; Cortez, Silva, & Areal, 2009; Hamilton, Jo, & Statman, 1993; Mallin, Saadouni, & Briston, 1995). Other studies have suggested that CSR may be associated with financial performance (Margolis & Walsh, 2003; Orlitzky et al., 2003; Tosun, 2016), and one study has found that SRMF portfolios outperform the conventional portfolios during periods of market crisis (Nofsinger & Varma, 2012). However, there are no previous studies that have examined whether the extent of fund allocation into the socially responsible stocks as evidenced by the ESG ratings of the fund portfolios differentiates fund performance. This study examines whether ESG ratings of SRMF are a factor in fund performance during periods of economic crisis and non-crisis. Based on the findings of previous studies, we hypothesize the following:

H1: The market index outperforms the SRMF on a risk-adjusted basis after controlling for Fama-French factors.
H2: SRMF with higher ESG ratings outperform SRMF with lower ESG ratings through the overall period of this study.
H3: ESG ratings of SRMF are associated with performance during periods of crisis (Great Recession) and non-crisis (periods prior to and after the Great Recession).

III. Methods

Data

We used data from the Morningstar® database for the analyses in this study. The study periods used were for the 2005–2016 period. Additional panel data analyses were performed on the sub-panel periods (T1, T2, T3) of 48 months each, with 144 months total. The first sub-panel was for the 2005–2008 period, followed by 2009–2012, and then for the 2013–2016 period. We chose funds that are US-domiciled for this study. Similar to the methodology suggested in previous studies (Grossman & Sharpe, 1986; Sauer, 1997; Statman, 2006), SRMFs with low social performance ratings were excluded, and only SRMFs in the top half of the SRI category in the Morningstar® database were examined. Specifically, to focus on the long-term consequences of allocating into SRMF for individual investors, this study focuses narrowly on the surviving funds over the 2005–2016 period. The Morningstar® database includes the ESG ratings for funds that incorporate environmental, social, and governance factors. Environmental issues include climate change and carbon emissions, air and water pollution, energy efficiency, water scarcity, waste management, and deforestation. Social issues include product safety, data protection/privacy, gender and diversity, employee engagement, supply chain management, and labor standards. Governance issues include board composition, audit committee structure, executive compensation, lobbying, political contributions, and bribery and corruption.

Analyses

The analyses for this study are conducted in two phases. To test H1, the first phase compares the performances of SRMF against the market index during the overall 2005–2016 period, followed by the 2005–2008, 2009–2012, and 2013–2016 sub-periods after controlling for the five Fama-French factors. To test H2 and H3, the second phase of this study examines whether ESG ratings are associated with SRMF performances after controlling for various fund-related characteristics during the overall 2005–2016 period, followed by 2005–2008, 2009–2012, and 2013–2016 sub-periods. The empirical models used in our analyses are as follows:

Regression Equation I: The first dependent variable is the SRI fund returns over the periods (Ri-Rf). The independent variables are the Fama-French five factors:

$$[R_{it} - R_{Ft}] = \alpha_i + \beta_{MRPi}[MRP_t] + \beta_{SMBi}[SMB_t] + \beta_{HMLi}[HML_t] + \beta_{RMWi}[RMW_t] + \beta_{CMAi}[CMA_t] + \varepsilon_i$$

An ordinary least squares (OLS) regression with fixed effects were estimated for the panel data used in this study.

Regression Equation II: The second dependent variable was the rolling average of the Sharpe ratios. The independent variables included in these models are ESG score level, manager tenure, expense ratio, fund size, and fund age.

$$SHARPE_i = \alpha_i + \beta_{mid_{esg}} Mid_{ESG_i} + \beta_{low_{esg}} Low_{ESG_i} + \beta_{tenure} TENURE_i + \beta_{exp} EXP_i + \beta_{size} SIZE_i + \beta_{age} AGE_i + \varepsilon_i$$

The ESG categories in this model are not time varying; therefore, pooled panel estimation with OLS regressions were computed for this part of the study. The dependent variable for regression equation 1 is risk premium (Ri-Rf). The dependent variable for regression equation 2 is Sharpe ratio (Rp-Rf/σ).

Independent Variables

The independent variables included in the first phase of this analysis comprise the Fama-French 5-factor model (Fama & French, 2016). The market risk premium (Rm-Rf) is the additional return of the market over the risk-free rate and is based on the Capital Asset Pricing Model (CAPM) (Sharpe, 1964). SMB is the difference in the mean returns of the nine small cap portfolios and nine large cap portfolios as computed by Fama and French (1996), while HML is the difference in the mean returns of the two value portfolios and the two growth portfolios as computed by Fama and French (2010). RMW is the difference in the mean returns between the two robust operating profitability portfolios and two weak operating profitability portfolios constructed by Fama and French (Nichol & Dowling, 2014). Finally, CMA is the difference in the mean returns of two

aggressive investment portfolios and two conservative investment portfolios (Nichol & Dowling, 2014).

The independent variables of interest in the second phase of this study were based on the ESG® ratings of the variables. This study divides the funds into tertiles, where funds in top 33% of the assigned ESG scores are categorized as High ESG, followed by funds in the middle 33% of ESG scores as Mid ESG, and funds in the lowest 33% of ESG scores as Low ESG. Binary variables are created to represent each tertile as a variable in the empirical model. Other control variables in regression equation 2 included tenure of the fund manager, expense ratio, and size of the mutual fund. These variables were included because of the association of these variables with fund performance in previous literature (Das et al., 2018; Jain & Wu, 2000).

IV. Results

Descriptive Statistics

The descriptive statistics for this study are shown in Table I. When examining within the SRMF tertiles, the results indicate that SRMF in the lowest ESG tertile had significantly higher risk-adjusted returns across all periods except 2005–2008. During the 2005–2008 period, which included the Great Recession, SRMF on the middle and lowest tertiles of ESG scores had lower risk-adjusted (Sharpe) returns than the SRMF in the highest tertiles of ESG scores. The highest ESG-rated SRMF outperformed other SRMF counterparts during periods of market uncertainty.

Table I: Descriptive Statistics

Variables	Panel 2005-2016		Panel 2005-2008		Panel 2009-2012		Panel 2013-2016	
ESG_category	Monthly Return	Sharpe Ratio	Monthly Return	Sharpe Ratio	Monthly Return	Sharpe Ratio	Monthly Return	Sharpe Ratio
Low	0.65	0.71	-0.39	0.3	1.33	0.63	0.99	1.18
Med	0.56	0.76	-0.37	0.4	1.12	0.6	0.94	1.26
High	0.51	0.65	-0.32	0.56	1.11	0.43	0.75	0.96
Chi-Squared	**p<0.01	***p<0.001	***p<0.001	***p<0.001	***p<0.001	**p<0.034	***p<0.001	***p<0.001

Performance of SRMF When Controlling for the Fama-French 5-Factor Model

The results from the panel regressions are presented in Table II. This model uses the Fama-French 5-factor model and indicates that during the overall period 2005–2016 (Panel A), market risk premium (MRP) and RMW were positively associated with SRMF performance. Conversely, the alpha, SMB, HML, and CMA factors were significant and negatively associated with SRMF

performance. During the period leading up to and through the Great Recession (2005–2008) as shown in Panel B, MRP was positively associated with SRMF performance; whereas, SMB, HML, and CMA were negatively associated with SRMF performance.

Table II: SRMF Performance with Fama French 5 Factor Model

Variables	**Panel A.**		**Panel B.**		**Panel C.**		**Panel D.**	
	2005-2016 (n =73)		2005-2008 (n =73)		2009-2012 (n =73)		2013-2016 (n =73)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Alpha	-0.13***	0.01	-0.02	0.03	-0.08***	0.02	-0.22***	0.02
MRP	0.99***	0.00	0.98***	0.01	0.95***	0.01	0.95***	0.01
SMB	-0.03***	0.00	-0.04***	0.01	-0.02**	0.01	-0.04***	0.01
HML	-0.02***	0.00	-0.04***	0.01	-0.02**	0.01	-0.02	0.01
RMW	0.04**	0.01	0.01	0.02	0.02	0.01	0.07***	0.01
CMA	-0.13***	0.01	-0.15***	0.02	-0.12***	0.02	-0.14***	0.02

**p<0.05; **p<0.01; ***p<0.001*

In the period just following the Great Recession (2009–2012) as shown in Panel C, the results indicate that MRP was positively associated, but alpha, SMB, HML, and CMA were negatively associated with SRMF performance. Similarly, in the period following this (2013–2016), as shown in Panel D, MRP and RMW were positively associated with fund performance; whereas, alpha, SMB, and CMA were negatively associated with SRMF returns.

Determinants of Risk-Adjusted SRMF Performance When Controlling for ESG Ratings

The second part of our analysis focuses on examining the determinants of risk-adjusted SRMF performance when controlling for the ESG ratings. The results from Table III indicate that during the overall period of this study 2005–2016 (Panel A), medium and lower ESG-rated SRMF had higher risk-adjusted returns when compared with the higher ESG-rated SRMF. Management tenure, fund size, and age were also positively associated with fund performance.

The results in Panel B are estimated over the period leading up to and through the Great Recession (2005–2008). During this period, both medium and low ESG-rated SRMF were negatively associated with risk-adjusted fund performance when compared with the reference group of high ESG-rated SRMF. Additionally, management tenure and fund size were positively associated with fund performance.

Table III: Determinants of Risk-Adjusted SRMF Performance by ESG Ratings

	Panel A.		**Panel B.**		**Panel C.**		**Panel D.**	
	2005-2016 (n =73)		2005-2008 (n =73)		2009-2012 (n =73)		2013-2016 (n =73)	
Variables	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
ESG Scores (Ref: ESG High)								
ESG_Mid	0.07***	0.02	-0.22***	0.07	0.14***	0.05	0.28***	0.07
ESG_Low	0.06***	0.02	-0.23***	0.07	0.19***	0.05	0.22***	0.07
Management Tenure	0.01***	0.00	0.01**	0.00	0.01	0.02	0.01*	0.00
Expense Ratio	-0.01	0.01	0.01	0.01	-0.05*	0.03	0.04	0.04
Fund Size	0.02***	0.00	0.02***	0.00	0.02**	0.01	0.02**	0.01
Age	0.01***	0.00	0.01	0.01	0.02**	0.01	0.04**	0.00
Intercept	0.51	0.33	-0.28	0.25	0.19	0.15	0.24	0.28

**p<0.05; **p<0.01; ***p<0.001*

The results in Panel C are estimated over the period immediately following the Great Recession (2009–2012). The results indicate that both medium and low ESG-rated SRMF were positively associated with risk-adjusted SRMF returns when compared with the reference group of high ESG-rated funds. Expense ratios were negatively associated with fund performance. In addition to these factors, fund size and age were also positively associated with fund performance.

The results in Panel D are estimated over the 2013–2016 period. The results indicate that medium and low ESG-rated SRMF were positively associated with risk-adjusted performance when compared with the reference group of high ESG-rated SRMF. Management tenure, fund size, and age were also positively associated with risk-adjusted fund performance.

V. Discussions and Conclusion

The findings from this study informs the literature on SRMF performance leading to and through the period of Great Recession and through the subsequent recovery and economic expansion periods following the Great Recession. The results of this study are consistent with our hypothesis that given the efficiency of the financial markets, SRMF underperformed in the market over the period of study. However, it should be noted that many investors who participate in SRMF have a sustainable or socially responsible motive, and outperforming the market is usually not the most important criteria for these investors. The results also indicate that although the SRMF had negative alpha relative to the market during the overall study period (2005–2016), the positive association of MRP and RMW with SRMF returns indicates that the SRMF did well when the overall market premium went up and when the robust stocks outperformed the weak stocks. Consistent with this, the SRMF returns were negatively associated with SMB and HML factors. More research is needed to understand SRMF fund behavior when controlling for SMB and HML factors. The negative association between SMB and SRMF returns could be because the SRMF portfolios were biased towards bigger company stocks. The negative association between SRMF returns and HML indicates that the SRMF portfolios comprise low book-to-market (growth) rather than high book-to-market (value) stocks.

The results from this study find mixed evidence in support of H2 but support H3. Contrary to H2, that the higher ESG-rated SRMF outperform lower- and medium-rated SRMF, the results comparing risk-adjusted returns by ESG rating categories indicates that the medium- and lower-rated SRMF outperformed the higher-rated SRMF during all periods except during the period that overlapped with the Great Recession. Therefore, the results from this study indicate that the medium and lower ESG-rated SRMF were less resilient than the higher ESG-rated SRMF during the period of economic crisis. SRMF with longer management tenure, age, and larger fund size were positively associated with risk-adjusted performance during the period of this study.

The analyses in this study were estimated over a critical period for the market that included the period leading up to and through the Great Recession and then through the period of subsequent recovery. The results indicate that the SRMF performance was not significantly different from the market during the period of economic crisis, although the SRMF underperformed in the market during the overall period of this study. However, the period of existence of SRMF and the period covered in this study are relatively short given over 100 years of data now available for our financial markets. Future studies need to be done to examine whether SRMF performance remains consistent over longer periods of time and whether the ESG ratings remain a predictor of SRMF performance over longer periods of time.

One limitation of this study was the availability of past data for a limited number of funds. However, the SRMF universe has been growing rapidly (Yan et al., 2018) and future studies will have access to SRMF performance data over a longer period of time. Another limitation of this study was that it focused primarily on US-based SRMF. In future, it will be interesting to examine

whether factors associated with SRMF performance found in this study are also similarly associated with SRMF performance in international markets.

The association between ESG ratings and SRMF performance informs financial planners and wealth managers who are responsible for managing their clients' portfolios given their clients' risk tolerance (Grable & Chatterjee, 2014). The findings from this study informs practitioners that SRMF, even after controlling for various risk related factors, do not underperform the market during periods of market uncertainty. When examining the performances of SRMF based on the assigned ESG ratings, the results from this study suggest that medium and lower ESG-rated funds underperformed the higher ESG-rated funds during the period of economic crisis, although these funds outperformed the higher ESG-rated funds during other periods. Financial advisors and wealth managers may need to consider this fact that the higher ESG-rated SRMF are more resilient during periods of market crisis when allocating the assets of risk averse clients into SRMF.

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