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Are socially responsible exchange-traded funds paying off in performance?

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Abstract

This study examines the *Socially Responsible* (SR) exchange-traded funds (ETFs) by comparing their risk-adjusted performance with a matched group of *conventional* ETFs in the U. S. equity market. In contrast to prior studies that focus on actively managed mutual funds, we find that the risk-adjusted returns of *SR ETFs* are significantly lower than those of *conventional ETFs* during the 2005–2020 period. Such underperformance is only observed in non-crisis periods but not in economic crisis periods (i.e., the 2020 pandemic recession and 2008 financial turmoil). We attribute the observed underperformance of SR ETFs during the non-crisis periods to their limited diversification of unsystematic risks resulting from various negative or positive screens employed in the funds. We also find that net fund flows of the SR ETFs are less sensitive to past negative performance than are conventional fund flows. Collectively, our findings suggest that, instead of seeking wealth maximization, socially conscious investors may choose SR ETFs to gain non-economic utility.

KEYWORDS
exchange-traded fund, fund flows, portfolio performance, socially responsible investing

JEL CLASSIFICATION
A13, G11, G23

1 | INTRODUCTION

> There is one and only one social responsibility of business — to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud.
>
> Friedman (1970)

Socially responsible investing, an investment strategy pursuing both social and financial objectives, has become increasingly appealing in recent years. In general, socially responsible (SR) funds are composed of companies with transparent business practices, environmental care and supportive employee relations. The underlying rationale is that these social criteria are expected to increase a company's value by improving the company's social competitiveness and reducing the likelihood of financial penalties from ethical violations. By 2020, the total assets of socially responsible investment in the United States have reached $17.1 trillion, and the sustainable investing industry has grown more than 25-fold since 1995, with an annual growth rate of 14%.[1]

However, the extant literature has yet to reach a consensus regarding the financial performance of socially responsible funds. One strand of the theory argues that SR funds may not necessarily produce different expected returns compared with conventional funds. In accordance with the capital asset pricing model (CAPM) and its extended models, factors that are not proxying for risks should not affect an asset's expected return (Fama & French, 1992; Lintner, 1965; Ross, 1976; Sharpe, 1964). This suggests that the ethical component embedded in a socially responsible firm is not likely priced by the market. Bauer et al. (2005) investigate the performance of United Kingdom, German, and United States. SRs mutual funds and find no statistical differences in performance between SR mutual funds and conventional funds.

An alternative hypothesis argues that SR investments could decrease investors' expected returns. In this regard, socially responsible investors are willing to receive a lower expected return as a fair exchange for doing good for society. In other words, SR investors choose to pursue their social values by holding SR portfolios at the expense of economic gains (Bollen, 2007). Moreover, based on the Modern Portfolio Theory (Markowitz, 1952), investing in a constrained set of firms limits a portfolio's diversification and would lead to lower returns compared with an unbounded diversified portfolio at a given risk level.

It is also possible that SR investments could generate higher expected returns than conventional funds—"doing well while doing good." Compared with conventional firms, socially responsible firms are less likely to face financial penalties due to ethical violations. Furthermore, companies that adopt socially responsible practices are often believed to have good business credibility, which plays a crucial role in revenue generation and market competition.[2] This will, in turn, increase a firm's growth opportunities and lead to higher expected returns for the SR portfolios. That is to say, SR investors would gain higher expected returns by pursuing both social values and financial goals.

These theories suggest that SR funds could underperform, outperform, or perform the same as conventional funds. Unlike prior studies that, in large part, focus on the performance of SR mutual funds, we extend this line of literature in our study by investigating the performance of U.S. SR exchange-traded funds that employ passive investing strategies.[3] The passively investing ETF market is a more suitable laboratory because the nature of mutual funds would limit our ability to identify the exact driving force in return variations. First, the passive scheme of ETFs enables us to screen out the confounding effect of fund managers' selection skills in the comparison analysis. Prior studies using SR active mutual funds are often subject to the joint hypothesis problem: the performance differences between SR funds and non-SR funds are driven by both SR investment screening strategies and fund managers' skill levels. Thus, the exclusive analysis of passively managed ETFs will deliver more convincing results regarding the impacts of SR investment screening strategies on fund performance. Second, the nature of ETFs' lower turnover and management expense, greater transparency, and higher liquidity could help us avoid possible noise introduced by transaction costs and other market inefficiencies. Prior studies (e.g., Antoniewicz & Heinrichs, 2014; Hill et al., 2015) documented that the ETF structure allows to externalize transaction costs and hence enables lower fees than the

active mutual fund. In addition, ETFs typically offer greater transparency and higher liquidity since their investment strategies are well specified in advance and their holdings are updated more frequently and they can be traded intraday. Overall, our study is not likely to be subject to the impact of turnover costs, transaction costs, or other market inefficiencies.

Through our baseline analysis of the calendar-time portfolio approach, we find that the risk-adjusted returns of SR ETFs are significantly lower than those of matched conventional ETFs during our sample period (2005–2020). Specifically, SR ETFs deliver lower CAPM-based alphas than the matched conventional counterparts by 0.021% on a daily basis (equivalently, 5.25% per annum). Employing multi-factor models, we find significantly negative alphas in a difference test after controlling for market risk, size, book-to-market, and momentum (and investment and profitability) factors. The mean difference in the risk-adjusted returns of the two groups ranges from −0.022% to −0.019% per day. These findings are in contrast to prior studies on mutual funds (e.g., Bauer et al., 2005; Galema et al., 2008; Renneboog et al., 2008; Derwall & Koedijk, 2009; etc.). We argue that socially conscious investors are willing to pay a premium for their socially responsible investing.

In exploring whether the performance of SR investments is associated with financial risk, we split the sample into crisis periods (the 2008 financial turmoil and the 2020 Covid-19 pandemic crisis, which include October 2007–March 2009 and February 2020–May 2020, respectively) and non-crisis periods (January 2005–September 2007 and April 2009–January 2020). We find that the negative performance difference remains significant during the non-crisis periods. Specifically, the SR ETFs underperform the conventional ETFs by 0.021%–0.022% per day in such normal periods. However, we demonstrate that the SR ETFs neither outperform nor underperform their conventional peers during economic downturns. These results contradict with the prospect theory utility hypothesis proposed by Nofsinger and Varma (2014),[4] who observe that actively managed SR mutual funds deliver better performance than their matched counterparts in periods of market crises. We argue that their observations of overperformance of SR mutual funds during the crisis periods may simply be attributed to fund managers' superior abilities (i.e., stock-picking, market-timing, and style-timing skills). Considering the passive management style of our samples of SR ETFs, however, our finding of the similar performance between SR and conventional ETFs during the market downturns is less likely associated with the influence of fund managers.

In addition to the baseline analysis of the calendar-time portfolio approach, we also conduct the fund-level panel data regression analysis as a robustness check. Specifically, we compute the rolling alphas for each sample ETF and regress the rolling alphas on a dummy indicator for SR ETFs, controlling for various fund characteristics, time fixed effects, style variables, and fund family fixed effects. We also allow a crisis dummy and its interaction term with the SR indicator in the specification in order to examine the heterogenous effects that may be caused by the market crisis across ETFs. Consistently, we document that on the individual fund level, SR ETFs also deliver significantly lower risk-adjusted returns than conventional ETFs in the full sample period and non-crisis periods. But there is no significant difference in the risk-adjusted performance between these two groups of ETFs in times of market crash. Accordingly, we argue that investors in SR ETFs do not simply give up some returns in non-crisis periods in order to pursue higher abnormal returns in crisis periods. Instead, socially conscious investors are willing to sacrifice some financial benefits in exchange for doing good for society.

Lastly, we also investigate the flow-return relation to reveal how the past fund performance influences socially conscious investors' decisions and their money flows. If our contentions in the baseline analysis and fund-level panel data analysis are robust (i.e., investors in SR ETFs are more concerned with social or ethical values than financial performance), SR ETFs' net fund flows would be less sensitive to the lagged fund performance. Interestingly, we find that investors in SR ETFs appear to care less about lagged negative performance than do investors in conventional ETFs. The fact that SR ETFs' net fund flows are significantly less related to past negative financial performance implies that socially conscious investors value nonfinancial attributes in their investment decisions.

Our study contributes to the literature in several ways. First, using ETFs that employ passive investing strategies instead of actively managed mutual funds, we are able to overcome the empirical challenge due to the joint effect of portfolio performance and selection skills. That is, differences in SR fund performance are not likely driven by fund

managers' abilities and skills. To the best of our knowledge, this is the first study investigating the performance of the passively-managed SR ETFs, and our findings extend the literature on whether investors pay a price for restricting their portfolios to SR investment attributes. Secondly, our results are independent of possible biases associated with transaction costs and high turnovers. Due to the nature of passive investing, management fees of ETFs are typically lower than those of mutual funds. This enables us to evaluate the performance of SR investments more accurately than mutual funds. Also, our results are not subject to a high turnover rate and other market inefficiencies. In general, ETFs only rebalance portfolios when there is a change in the underlying index.

Thirdly, this is the first study, to our knowledge, examining the performance of SR investments during both the 2020 Covid-19 pandemic recession and 2008 financial meltdown. Hence, our paper contributes to a rapidly growing body of literature on the financial implications and stock performance of the economic crises. The psychological attraction hypothesis (Hirshleifer, 2008) proposes that investors tend to pay greater attention to corporate malfeasance during economic downturns. Moreover, the prospect theory (Kahneman & Tversky, 1979) argues that investors are more negatively impacted by losses than they are positively impacted by a similar amount of financial gains. This suggests that an investor's preference may change under different economic conditions. The recent COVID pandemic crisis, along with the 2008 financial turmoil, offers us sufficient observations to investigate the risk-adjusted performance of SR ETFs in economic downturns. We demonstrate that SR funds do not provide downside protections for socially conscious investors, as SR ETFs simply underperform their conventional counterparts during normal periods but fail to deliver superior performance during market downturns. We attribute the prior studies' findings of overperformance of (actively managed) SR mutual funds during the crisis periods to fund managers' superior abilities and managerial skills. In contrast with the prospect-theory based utility hypothesis (Nofsinger & Varma, 2014), our findings indicate that socially conscious investors in the ETFs do not simply pursue their economic goals of wealth maximization but, instead, are willing to pay a cost for their socially responsible investing, particularly in non-crisis periods. In other words, our paper provides evidence to corroborate the non-financial utility hypothesis that an investor's behavior could also be driven by ethical and social considerations (e.g., Bollen, 2007; Hood et al., 2013; Renneboog et al., 2008; Statman, 2004).[5]

Finally, our study also expands literature on the interplay between fund flows and performance in the SR fund market. Prior studies mostly concentrate on the behavior of socially responsible investors via mutual fund flows, by comparing fund inflows and outflows of socially responsible and conventional mutual funds in response to the lagged fund performance. It is well documented in the literature that SR fund flows are less sensitive to past returns than conventional fund flows in the mutual fund industry (e.g., Bollen, 2007; Benson & Humphrey, 2008; Renneboog et al., 2011). We supplement this series of work by showing that socially responsible investors are also insensitive to the past fund performance in the ETF sector. Particularly, they are less likely to withdraw money from poorly performing ETFs compared with conventional investors. These findings shed light on the role of SRI's nonfinancial attributes in investors' decision-making process. At last, our study enriches the understanding of investor behaviors in exchange traded funds.

The outline of this paper is as follows. Section 2 discusses the background and related literature. Section 3 presents our data and methodology. Section 4 articulates empirical findings. Section 5 concludes our study and discusses future research directions.

2 | INSTITUTIONAL BACKGROUND AND LITERATURE REVIEW

2.1 | SR fund: Background

Since the 1960s, a series of social movements has led investors to be more aware of the social consequences of their investments. The first modern SR fund, Pax World Fund, was established in 1971, and the fund excluded weapons business in its portfolio and was targeted at investors opposing the Vietnam War. Since the 1980s, an increasing

number of SR investments have been launched. The covered programs included South Africa, alcohol, tobacco, and gambling in the 1990s, company transparency and political spending in the 2000s, and climate change, diversity, and human rights in the 2010s.

As a socially screened investment vehicle, SR investment strategies integrate investors' ethical and social interests with their investment decisions. SR investors, on the one hand, regard the fund as a standard risk–reward investment instrument. On the other hand, SR investors also derive non-financial utilities from investing in companies that have the same social values as they do. Bollen (2007) proposes that SR investors may have a multi-attribute utility function. He finds that the sensitivity of fund flow to lagged negative returns is lower in SR funds, as compared with conventional funds. This suggests that the social attribute of SR funds mitigates investors' tendency to shift their capital away from underperforming SR funds. Similarly, Riedl and Smeets (2017) find that investors hold SR funds to boost their social image. Specifically, they discover that investors who talk more often about their investments are more likely to invest in SR funds. These investors would be willing to accept inferior financial performance in order to invest in accordance with their social preferences.

2.2 | SR fund: Performance consequences

The number of SR mutual funds has dramatically grown worldwide over the last few decades. For instance, from 1995 to 2005, the number of SR mutual funds increased from 55 to 201 in the United States and from 54 to 375 in Europe. The total sustainable fund asset value was $179 billion in the United States and 30 billion in Europe in 2005 (Renneboog et al., 2008), and it hit a record $1.7 trillion in the global market in 2020.[6] Recently, Morningstar Manager Research[7] reported that the number of SR funds available to U.S. investors grew to 392 in 2020, a nearly fourfold increase over a decade. In 2020 only, SR funds attracted $55 billion net cash flows in the United States and EUR 233 billion in Europe. With the rapid growth of the SR investment industry, a natural question of interest is how these SR funds perform around the world.

The first strand in the literature argues that SR mutual funds underperform conventional funds. Ghoul and Karoui (2017) use an asset-weighted score to measure a company's corporate social responsibility (CSR) rating over time and investigate the impact of CSR on the performance of the U.S. equity mutual funds and flow-performance relationship. They find that portfolios with higher CSR scores are associated with lower risk-adjusted performance. Nofsinger and Varma (2014) investigate the performance of SR funds during crisis and non-crisis periods using U.S. equity SR funds during the period 2000–2011. They find that socially responsible mutual funds perform poorly during the non-crisis period.

The second strand of research suggests that SR mutual funds do not necessarily underperform the non-SR mutual funds, and investors do not need to sacrifice economic incentives for their SR investments. Schroder (2004) examines the SR investment performance for 30 U.S. funds and 16 German and Swiss funds. He uses a blue-chip index and a small-cap index as benchmarks to estimate Jensen's alphas. Only 4 out of 46 alphas in his study are significantly negative at the 5% level, suggesting that SR funds do not significantly underperform their benchmarks. Similarly, Bauer et al. (2005) use the Carhart multi-factor model (Carhart, 1997) to compare the United States, United Kingdom, and Germany SR investments for the 1990–2001 period. They find no evidence of a statistically significant difference in returns between SR mutual funds and conventional mutual funds. Their finding suggests that SR funds are less exposed to market return variability than conventional funds. SR investments of the United Kingdom and Germany are more exposed to small-cap companies, while the United States. SR investments are overweight toward large-cap companies. They conclude that SR funds tend to be more growth-oriented than conventional funds. Galema et al. (2008) further explain that SR stocks in the United States are associated with lower book-to-market ratios, and hence, SR investment features do not generate any abnormal returns.

It is worth noting that numerous studies focusing on cross-country evidence support the idea that SR mutual funds returns are indistinguishable from conventional funds. For example, the performance difference between SR

and non-SR funds is not statistically different from zero for the United Kingdom, Australian, and Canadian SR funds (Bauer et al., 2006; Bauer et al., 2007; Gregory et al., 1997; Luther et al., 1992; Mallin et al., 1995). Kreander et al. (2005) examine the performance of SR funds from European countries including Belgium, Germany, Netherlands, Norway, Sweden, Switzerland, and the United Kingdom using weekly data. They find that there is no significant performance difference. Similarly, Renneboog et al. (2008) study the performance of SR funds around the world. They find that SR funds in the United States, the United Kingdom, and many continental European and Asia-Pacific countries underperform their domestic benchmarks by −2.2% to −6.5% per annum. For most of the countries in their sample, however, risk-adjusted returns in SR funds are not significantly different from those in conventional funds.

The third strand argues that SR mutual funds investments can deliver superior returns to investors. Henke (2016) compares the risk-adjusted return of 103 SR funds in the United States and Eurozone with a matched sample of conventional funds during 2001–2014. The empirical result shows that the socially responsible bond funds outperform the conventional bond funds by 0.33%–0.49% annually. Henke (2016) also splits the sample into crisis and non-crisis periods and finds that SR investments' outperformance is most likely to occur during bear markets.

2.3 | SR investment performance and financial crisis

During the financial crisis of 2007–2009, assets employing SR investment strategies surprisingly grew more than 13%, while overall assets remained roughly stable (Nofsinger & Varma, 2014). As the SR funds have experienced tremendous growth in both good and bad times, the performance of the SR and conventional mutual funds in crisis and non-crisis periods has attracted increasing scholarly attention.

Prior studies provide evidence that mutual funds perform abnormally better during recession times than during good times (Glode, 2011; Kosowski, 2011; Moskowitz, 2000). Nofsinger and Varma (2014) investigate why there is an increasing demand for SR investment strategies, regardless of the perception that the strategies mostly generate negatively abnormal returns. They compare the performance of U.S. domestic equity SR mutual funds with matched conventional mutual funds during periods of market crisis and non-crisis. They find SR funds hold up better than their matched conventional mutual funds during the crisis period. That is, SR funds dampen downside risk for investors during poor economic conditions.

Ortas et al. (2014) compare the risk-adjusted returns and systematic risk levels of SR investment indexes in Europe with the benchmarks and find that SR investment indexes do not underperform their benchmarks in terms of risk-adjusted returns. They find, however, that SR investment indexes experience a higher level of systematic risks, especially during a market downturn. Their result suggests that SR equity indexes are more sensitive to changes in the market cycle. In other words, after excluding sectors, such as weapons, tobacco, alcohol, and adult entertainment, the SR equity indexes are more sensitive to changes in the market cycle.

3 | DATA

Our sample ETFs are domiciled and registered for sale in the United States during the period January 2005–May 2020. The survivorship-bias-free SR ETFs are obtained from the Steele Database[8] and the Center for Research in Security Prices (CRSP). We focus on equity ETFs and exclude exchange-traded notes (ETNs), leveraged and inverse ETFs, real estate investment, currency and commodity investment, and bank-loan convertibles. We further restrict our sample to ETFs that employ the passive investing strategies[9] with at least 12 months of data. Inactive funds are included in our research to mitigate any possible survivorship biases. Since SR funds are not explicitly identified in the CRSP database, we use the Steele database to construct portfolios with SR investment strategies (ETFs with the attributes of being ethical, environmental, social, and governance-related, religiously responsible, or clean energy and clean technology-focused). Regarding the reference group, we use equity ETFs that do not explicitly claim to use

socially responsible screens. Return and fund flow data are collected from the CRSP database and FactSet, respectively. All returns are inclusive of any distributions and net of expense fees. The final sample comprises 1837 live and inactive exchange-traded funds (including 92 socially responsible investing ETFs and 1745 unmatched conventional ETFs), with daily returns from January 3, 2005 through May 29, 2020. The asset under management for our sample SR ETFs has increased substantially from 4.6 billion in 2010 to 15.6 billion in 2020. Our sample of SR ETFs employ passive investing strategies; 78 of them are categorized as index funds.

The fund-specific characteristics are obtained from the Steele database. Table 1 describes the summary information on ETFs characteristics, such as fund age, fund size, net asset value, expense ratio, net fund flow, number of funds, and rate of return. The fund size is presented in millions of U.S. dollars and measured as the total assets under management of the ETFs. The expense ratios are denoted in percentages and expressed as an annual rate. Similar to the findings in the mutual fund market (Bauer et al., 2005), we find that SR ETFs are typically 2.34 years younger and less mature than non-SR ETFs. In addition, the average SR ETF is about three times smaller in size, with $1195.23 million in assets under management, compared to $5096.92 million for non-SR counterparts. The average expense ratios are very similar between the two groups (0.52% for SR fund and 0.49% for Non-SR funds), and they are substantially lower than those documented in the actively managed mutual fund markets. For example, Bauer et al. (2005) show that the expense ratio of the U.S. SR mutual funds is as high as 1.49% per year. Both SR and conventional ETFs have experienced strong growth over time, with the average monthly fund flow growth rate of 2.48% and 2.21%, respectively. Moreover, we find that the average daily return of the SR ETFs is 0.027% during the whole sample period, which is very close to that of conventional funds (0.026%).[10] However, the SR ETFs report more negative average daily returns than their matched non-SR peers during the 2008 financial turmoil, while the 2020 Covid pandemic recession observes the opposite.

To examine the impact of SR investment screens on risk and returns, we compare the performance of SR ETFs with a group of conventional ETFs using fund characteristics as matching criteria (Bauer et al., 2005; Nofsinger & Varma, 2014). Specifically, to make our control group of conventional ETFs comparable to the SR ETFs, we follow Nofsinger and Varma's (2014) approach and match them by fund age, fund size, investment objectives, and active status. For each SR ETF, we identify three conventional ETFs with similar years in existence, total net asset under management, fund objectives, and active status. We also require that the three matched conventional ETFs must come from different fund families.[11] This procedure generates a control group of 276 conventional ETFs. The final sample consists of 92 SR ETFs and 276 conventional ETFs that are matched by fund age, size, styles, and active status. Subsequently, we compute the equal-weighted returns of all ETFs in our SR group and control group.

4 | EMPIRICAL ANALYSIS

4.1 | Baseline analysis

In computing SR ETFs' risk-adjusted abnormal returns relative to the matched group, we use both the unconditional and the conditional versions of the CAPM-based models in the estimation. The unconditional model is characterized by the following equation:

$$R_t = \alpha + \beta_{MKT} MKT_t + \varepsilon_t \quad (1)$$

where R_t represents the excess return of an equally weighted portfolio of the exchange-traded funds over the risk-free rate (the one-month T-bill rate) on day t, MKT_t is the market excess return, β_{MKT} is the factor loading on the market portfolio, and ε_t stands for the idiosyncratic return. The intercept, α, measures the risk-adjusted abnormal return. To account for possible time-series correlations in the residual term, we estimate standard errors for the regression coefficients using the Newey–West procedure (Newey & West, 1987). In addition, we use the Carhart four-factor

TABLE 1 Characteristics of SR and non-SR exchange traded funds (ETFs)

							Whole sample period		2008 financial crisis		2020 Covid pandemic	
	Fund age (in years)	Fund size (in million)	NAV	Expense ratio (%)	Net fund flow	No. funds	Return (%)	Standard deviation (%)	Return (%)	Standard deviation (%)	Return (%)	Standard deviation (%)
SR ETFs	9.43	1195.23	62.64	0.52	2.48	92	0.027	1.635	−0.182	3.486	−0.134	3.760
Non-SR ETFs	11.77	5096.92	70.95	0.49	2.21	1745	0.026	1.534	−0.131	3.120	−0.188	3.864
Non-SR (matched) ETFs	9.57	1244.77	54.83	0.54	2.53	276	0.026	1.544	−0.127	2.880	−0.163	3.271
All	11.69	4964.57	70.66	0.49	2.24	1837	0.026	1.537	−0.133	3.134	−0.185	3.859

Note: This table presents the main characteristics of the SR and non-SR exchange-traded funds in our sample, including average fund age (years since the fund's inception), average fund size (the assets under management in million dollars), net asset value (NAV), average expense ratio (fund management fees as the percentage of the assets invested), average monthly net fund flow (monthly net money flow as the percentage of the prior month asset under management of the fund), average daily rate of return, standard deviation of daily returns, and number of funds.

model (Carhart, 1997) and the Fama–French five-factor model (Fama & French, 2015) to capture other potential variations in the portfolio returns. The four-and five-factor models are constructed as follows.

$$R_t = \alpha + \beta_{MKT} MKT_t + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \beta_{UMD} UMD_t + \varepsilon_t \quad (2)$$

$$R_t = \alpha + \beta_{MKT} MKT_t + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \beta_{RMW} RMW_t + \beta_{CMA} CMA_t + \varepsilon_t \quad (3)$$

where SMB is the return spread of small minus large stocks (the size factor); HML is the return spread of high B/M minus low B/M stocks (the value factor); UMD is the return spread of the past 12-month winners minus the past 12-month losers (the momentum factor); RMW is the return spread between the most profitable and the least profitable firms (the profitability factor); CMA is the return spread of firms that invest conservatively minus aggressively (the investment factor). The data for the 1-month Treasury bill rate, MKT, SMB, HML, UMD, RMW, and CMA are obtained from Kenneth French's web page.

Using the above approach, we compute the risk-adjusted abnormal returns (the alpha) for both SR ETFs and conventional ETFs. Similar to prior studies (e.g., Bauer et al., 2005; Nofsinger & Varma, 2014; Renneboog et al., 2008), we construct a difference portfolio by taking the difference between the SR returns and conventional ETFs returns (SR—Conventional). This portfolio is used to examine the statistical differences in risk and return between the two investment approaches. Accordingly, the difference in the risk-adjusted performance between SR ETFs and conventional ETFs is more likely driven by the socially responsible investing screens.

In Panel A of Table 2, we present the empirical results of the capital asset pricing model for equally weighted portfolios of socially responsible and conventional ETFs from January 2005 through May 2020. We find that, on average, the alpha of SR ETFs is significantly negative, suggesting that SR ETFs underperform the stock market index during our sample period. However, the alpha of the average conventional ETFs is statistically and economically insignificant in the same period. Therefore, our finding does not support that conventional ETFs underperform the market benchmark. In fact, our analysis shows that SR ETFs deliver weaker performances than the conventional funds by 0.021%, on a daily basis (or 5.25% annually), at the 5% significance level.

In Panels B and C of Table 2, we show that both 4-factor and 5-factor multi-factor models generate significantly negative alphas in the regressions, after controlling for market risk, size, book-to-market, and momentum (investment and profitability for the 5-factor model) factors. The differences in alphas range from −0.022% to −0.019% per day. Particularly, we find that only SR ETFs significantly underperform the benchmarks. The results differ from the findings in the actively managed mutual fund studies (e.g., Bauer et al., 2005; Kreander et al., 2005; Nofsinger & Varma, 2014; Renneboog et al., 2008) which suggest there are no statistically significant distinctions between SR and conventional funds. However, the findings based on active management funds are subject to the dilemma of the joint test. That is, without separating the role of active fund managers from socially responsible investment strategies, it is difficult to identify the ethical impact in analyzing the SR investment performance. SR ETFs in our sample, on the other hand, employ passive investing strategies, in which fund managers do not play an active role in portfolio selections. As a result, the SR ETFs underperformance is more likely driven by the ethical and socially responsible screens, instead of poor security selection skills. Collectively, our findings of the underperformance of SR ETFs corroborate the view that SR portfolios contain the unsystematic component of risk. That is to say, SR ETFs constrain investors' opportunity set of available companies to own and hence face the risk of being under-diversified. This, in turn, leads to relatively poor performance (compared with other unbounded diversified counterparts) in the traditional mean–variance optimization framework. Hence, our results lend support to the non-financial utility hypothesis (e.g., Bollen, 2007; Hood et al., 2013; Renneboog et al., 2008; Statman, 2004) that the ethical nature of SR investments plays a part in diverting an investor's interest from exclusively pursuing wealth-maximization. In other words, socially conscious investors are willing to give up some economic gains in exchange for doing good for society.

Additionally, we also find that in Table 2, SR ETFs exhibit distinct investment styles in comparison to their conventional peers. This is in line with the findings in mutual fund literature (e.g., Bauer et al., 2005; Nofsinger &

TABLE 2 Abnormal returns of SR and conventional ETFs (January 2005–May 2020)

Panel A: Results from CAPM model

ETF	Alpha	Market	Adj. *R*-square
Socially responsible	−0.00022* (−1.96)	1.08122*** (51.10)	0.80
Conventional	−0.00001 (−0.18)	0.75321*** (73.65)	0.87
Difference	−0.00021** (−2.13)	0.32800*** (18.34)	0.32

Panel B: Results from four-factor model

ETF	Alpha	Market	SMB	HML	UMD	Adj. *R*-square
Socially responsible	−0.00020* (−1.87)	1.04532*** (46.48)	0.31717*** (8.96)	−0.01220 (−0.39)	−0.07322*** (−3.32)	0.82
Conventional	0.00002 (0.29)	0.71935*** (75.75)	0.14241*** (7.35)	0.05026*** (2.67)	−0.06350*** (−4.97)	0.88
Difference	−0.00022** (−2.23)	0.32597*** (16.27)	0.17476*** (5.97)	−0.06247** (−2.12)	−0.00972 (−0.51)	0.34

Panel C: Results from five-factor model

ETF	Alpha	Market	SMB	HML	CMA	RMW	Adj. *R*-square
Socially responsible	−0.00018* (−1.67)	1.02893*** −43.61	0.30181*** −8.57	0.05656* −1.77	−0.19372*** (−3.10)	−0.16033*** (−4.05)	0.82
Conventional	0.00002 −0.24	0.71515*** −67.57	0.14817*** −7.51	0.11845*** −6.28	−0.10465*** (−2.82)	0.01661 −0.69	0.87
Difference	−0.00019** (−1.99)	0.31378*** −15.42	0.15364*** −5.27	−0.06189** (−2.33)	−0.08907* (−1.90)	−0.17694*** (−5.28)	0.35

Note: This table reports the regression results of the CAPM model (Panel A), the Carhart four-factor model (Panel B), and the Fama & French five-factor model (Panel C) for equally weighted SR ETFs and matched conventional ETFs during the entire period from Jan 2005–May 2020. Difference is a portfolio which is constructed by subtracting matched conventional from SR ETFs returns. The *t*-statistics are presented in parentheses, calculated with Newey–West standard errors to account for auto-correlation. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

Varma, 2014; Renneboog et al., 2008) that SR ETFs have more exposure to market risk than their conventional counterparts. In the five-factor estimation, we find that SR ETF portfolios consist of more small-caps and more growth companies, as compared to their conventional peers. As Bauer et al. (2005) point out, SR funds are often underweight in value sectors, such as chemical, energy, and basic industries that typically carry a higher environmental risk. This, in turn, leads SR funds to be more growth-oriented. Finally, we find that SR ETFs are overweight in less profitable firms and firms with aggressive investment, compared to conventional ETFs. This is consistent with socially responsible firm practice to engage in environmental sustainability innovations and clean technology efforts, which are often associated with more spending and R&D expenditures.

4.2 | SR investment performance during crisis and non-crisis periods

Previous literature argues that SR funds perform differently from conventional funds under different market conditions. For example, SR funds could offer downside risk protection for investors in a market downturn (e.g., Nofsinger & Varma, 2014). In studying the SR investments' performance in different economic states, we split our sample into two periods: the crisis periods (including the 2008 financial turmoil of October 2007–March 2009 and the 2020 Covid-19 Pandemic of February 2020–May 2020) and the non-crisis periods (January 2005–September 2007 and April 2009–January 2020).[12] Following Nofsinger and Varma (2014), we estimate the crisis (C) and non-crisis (N) alphas by including the interactions of alphas and two dummy variables in our factor models. For example, the CAPM model, with crisis and non-crisis alphas, is estimated as follows:

$$R_t = \alpha_N D_{N,t} + \alpha_C D_{C,t} + \beta_{MKT} MKT_t + \varepsilon_t \quad (4)$$

where α_N represents the non-crisis period alpha, α_C represents the crisis period alpha, $D_{N,t}$ is a dummy variable that equals 1 if t falls in the non-crisis period and 0 otherwise, and $D_{C,t}$ is a dummy variable that equals 1 if t falls in the crisis period and 0 otherwise.

In Panels A, B, and C of Table 3, we present estimated alphas in crisis and non-crisis periods from different factor models. On the one hand, we find that non-crisis alphas are significantly negative for SR ETFs only (but not for conventional ETFs), ranging from −0.021% to −0.017% on a daily basis. Particularly, SR ETFs underperform conventional ETFs during the non-crisis periods by 0.021%–0.022% per day. The differences in alphas are statistically significant at the 5% level. On the other hand, we find that SR ETFs' performance also deteriorates during the crisis periods. Specifically, we find that the SR alphas in the crisis period, albeit being statistically insignificant,[13] are quantitatively consistent and significantly negative in economic terms with a range of −0.029% to −0.022%. Unlike non-crisis periods, however, the market crises also reveal fairly negative alphas in conventional ETFs. With worsening performance of conventional ETFs, we document that the differences in alphas between SR and conventional ETFs during the bear market periods are both statistically and economically indifferent from zero. This indicates that SR ETFs neither outperform nor underperform conventional counterparts in the periods of market turmoil. All these findings are robust even if we exclude the observations before April 2009 and simply have one crisis event (i.e., the very recent 2020 Covid-19 pandemic) in our sample. As reported in Table 4, we find that the differences in alphas between SR and conventional ETFs are statistically and economically insignificant in the 2020 Covid-19 pandemic crisis but significantly negative in non-crisis periods. The narrowing of the performance gap between these two groups of funds in the recent bear market seems to be largely driven by a big drop of conventional ETFs' performance. For example, we observe that alphas for conventional ETFs are economically negative during the recent pandemic, varying from −0.041% to −0.021%. These are very close to the ones for SR ETFs ranging from −0.037% to −0.023%.

It could be argued that our findings above are distorted by fund expense as transaction costs, which in general, play an important role in investment decisions. Hence, we also run a separate test by including management fees in

TABLE 3 Alpha estimates in crisis and non-crisis period

Panel A: Results from CAPM model				
ETF	**Alpha (NC)**	**Alpha (C)**	**Market**	**Adj. *R*-square**
Socially responsible	−0.00021** (−2.13)	−0.00026 (−0.44)	1.08116*** (50.92)	0.80
Conventional	0.00001 (0.24)	−0.00015 (−0.51)	0.75303*** (73.15)	0.87
Difference	−0.00022** (−2.44)	−0.00010 (−0.22)	0.32814*** (18.34)	0.32

Panel B: Results from four-factor model							
ETF	**Alpha (NC)**	**Alpha (C)**	**Market**	**SMB**	**HML**	**UMD**	**Adj. *R*-square**
Socially responsible	−0.00019**	−0.00029	1.04522***	0.31720***	−0.01236	−0.07329***	0.82
	(−1.99)	(−0.51)	(46.42)	(8.96)	(−0.40)	(−3.33)	
Conventional	0.00004	−0.00013	0.71917***	0.14246***	0.05000***	−0.06362***	0.88
	(0.70)	(−0.47)	(75.66)	(7.37)	(2.67)	(−5.00)	
Difference	−0.00022**	−0.00015	0.32604***	0.17474***	−0.06236**	−0.00967	0.34
	(−2.48)	(−0.33)	(16.27)	(5.96)	(−2.13)	(−0.51)	

Panel C: Results from five-factor model								
ETF	**Alpha (NC)**	**Alpha (C)**	**Market**	**SMB**	**HML**	**CMA**	**RMW**	**Adj. *R*-square**
Socially responsible	−0.00017*	−0.00022	1.02888***	0.30184***	0.05655*	−0.19383***	−0.16019***	0.82
	(−1.81)	(−0.40)	(43.55)	(8.56)	(1.76)	(−3.10)	(−4.06)	
Conventional	0.00004	−0.00013	0.71806***	0.14717***	0.11711***	−0.10177***	0.01867	0.88
	(0.70)	(−0.45)	(68.00)	(7.46)	(6.25)	(−2.75)	(0.77)	
Difference	−0.00021**	−0.00009	0.31082***	0.15468***	−0.06056**	−0.09206*	−0.17886***	0.35
	(−2.30)	(−0.20)	(14.94)	(5.28)	(−2.27)	(−1.94)	(−5.30)	

Note: This table measures the abnormal returns (alphas) for crisis and non-crisis periods using the CAPM (Panel A), the Carhart four-factor model (Panel B), and the Fama and French five-factor model (Panel C). The crisis periods include both 2008 financial turmoil and 2020 Covid-19 pandemic. We follow prior literature and identify crisis periods for the stock market: October 1, 2007 to March 31, 2009 and February 1, 2020 to May 29, 2020. The remaining times are classified as non-crisis period. Alpha (NC) is the non-crisis period abnormal return and Alpha (C) is the crisis-period abnormal return. The *t*-statistics are presented in parentheses, calculated with Newey–West standard errors to account for auto-correlation. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

TABLE 4 Alpha estimates in the 2020 Covid-19 pandemic crisis

Panel A: Results from CAPM model				
ETF	**Alpha (NC)**	**Alpha (C)**	**Market**	**Adj. *R*-square**
Socially responsible	−0.00026*** (−2.70)	−0.00037 (−0.29)	1.00421*** (49.11)	0.83
Conventional	−0.00005 (−1.05)	−0.00041 (−0.52)	0.74853*** (78.97)	0.92
Difference	−0.00021*** (−2.66)	0.00004 (0.04)	0.25567*** (15.21)	0.32

Panel B: Results from four-factor model							
ETF	**Alpha (NC)**	**Alpha (C)**	**Market**	**SMB**	**HML**	**UMD**	**Adj. *R*-square**
Socially responsible	−0.00022** (−2.47)	−0.00024 (−0.21)	0.94907*** (53.13)	0.28491*** (10.90)	0.06533*** (2.76)	−0.08912*** (−4.65)	0.85
Conventional	−0.00002 (−0.52)	−0.00023 (−0.35)	0.71357*** (88.13)	0.12665*** (8.53)	0.07391*** (4.54)	−0.07363*** (−6.46)	0.93
Difference	−0.00020** (−2.57)	−0.00001 (−0.01)	0.23550*** (15.01)	0.15827*** (6.82)	−0.00858 (−0.37)	−0.01549 (−0.87)	0.35

Panel C: Results from five-factor model								
ETF	**Alpha (NC)**	**Alpha (C)**	**Market**	**SMB**	**HML**	**CMA**	**RMW**	**Adj. *R*-square**
Socially responsible	−0.00020** (−2.24)	−0.00023 (−0.20)	0.93660*** (51.83)	0.26915*** (10.45)	0.10255*** (3.98)	0.07479 (1.60)	−0.19471*** (−5.73)	0.85
Conventional	−0.00002 (−0.44)	−0.00021 (−0.33)	0.71347*** (79.16)	0.13903*** (9.66)	0.12059*** (7.41)	0.02048 (0.79)	0.01405 (0.71)	0.93
Difference	−0.00018** (−2.37)	−0.00002 (−0.03)	0.22313*** (14.62)	0.13012*** (5.95)	−0.01804 (−0.80)	0.05432 (1.43)	−0.20876*** (−8.11)	0.36

Note: This table measures the abnormal returns (alphas) for the 2020 Covid-19 Pandemic crisis and non-crisis periods using the CAPM (Panel A), the Carhart four-factor model (Panel B), and the Fama and French five-factor model (Panel C). The non-crisis period is from April 1, 2009 to January 31, 2020 while the crisis period is from February 1, 2020 to May 29, 2020. We exclude the observations from January 2005 to March 2009. Alpha (NC) is the non-crisis period abnormal return and Alpha (C) is the crisis-period abnormal return. The t-statistics are presented in parentheses, calculated with Newey-West standard errors to account for auto-correlation. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

TABLE 5 The influence of fees on fund performance

Panel A: Full sample analysis			
ETF	**SR**	**Conventional**	**Difference**
CAPM Alpha	−0.00020* (−1.83)	0.00001 (0.12)	−0.00021** (−2.12)
Carhart 4-factor Alpha	−0.00019* (−1.74)	0.00003 (0.53)	−0.00022** (−2.22)
FF5 Alpha	−0.00016 (−1.53)	0.00003 (0.54)	−0.00019** (−2.02)

Panel B: Crisis and non-crisis analysis						
	SR		**Conventional**		**Difference**	
ETF	**Non-crisis**	**Crisis**	**Non-crisis**	**Crisis**	**Non-crisis**	**Crisis**
CAPM Alpha	−0.00020** (−1.99)	−0.00024 (−0.42)	0.00003 (0.49)	−0.00014 (−0.46)	−0.00022** (−2.44)	−0.00010 (−0.21)
Carhart 4-factor Alpha	−0.00017* (−1.84)	−0.00027 (−0.49)	0.00005 (0.96)	−0.00012 (−0.43)	−0.00022** (−2.48)	−0.00015 (−0.33)
FF5 Alpha	−0.00016* (−1.66)	−0.00021 (−0.37)	0.00005 (0.95)	−0.00011 (−0.40)	−0.00021** (−2.30)	−0.00009 (−0.20)

Note: This table presents the influence of management fees on alpha estimates. We compute the alphas of SR and conventional ETF portfolios gross of management fees by adding back management fees to the fund returns. Panel A presents performance measures for the entire period, whereas Panel B measures for crisis and non-crisis periods. The CAPM Alpha is calculated using the CAPM model, Carhart 4-factor Alpha is calculated using the Carhart 4-factor model, and FF5 Alpha is calculated using the Fama and French 5-factor model. The t-statistics are presented in parentheses, calculated with Newey-West standard errors to account for auto-correlation. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

the fund performance and report the result in Table 5. The test results show that our baseline findings are not affected by the management fees. Regardless of the choice of factor models, we find the consistent results that SR alphas remain lower than the conventional ETFs in our full sample period and non-crisis period. Therefore, the poor performance of SR ETFs is unlikely to be attributed to fund fees.

Overall, we only observe the underperformance of SR ETFs relative to conventional ETFs during the non-crisis periods. As the bear markets reveal noticeably negative excess returns for both groups of ETFs, however, we find no evidence of outperformance of SR ETFs over their conventional counterparts during the crisis periods. These findings in the passive SR ETFs market are in stark contrast with prior studies of actively managed SR mutual funds (e.g., Nofsinger & Varma, 2014).[14] Nofsinger and Varma (2014) find that SR mutual funds perform slightly better than their conventional counterparts in market downturns,[15] while they deliver lower alphas during the non-crisis periods. They argue that such an asymmetric return pattern can explain why some investors have incentives to pay a price for ethics or socially responsible investing. Specifically, investors with prospect theory utility functions (such functions in the loss domain are steeper than the ones in the gain domain) are willing to give up some returns in non-crisis periods in order to earn some higher excess returns during crisis periods. This suggests that SR investors, like other rational market participants, derive the traditional expected financial utility and make investment decisions based on their economically rational goal of wealth maximization.

Nevertheless, the argument of investors' prospect theory (financial) utility functions by Nofsinger and Varma (2014) could not lead to the increasing popularity of SR exchange-traded funds during the last two decades, since we do not find the asymmetric return patter over time in such passively managed exchange-traded funds. That is

to say, the superior performance of the actively managed SR mutual funds during the periods of economic crisis observed by Nofsinger and Varma (2014) might not simply be attributed to the fund's socially responsible attributes. Instead, it could be explained by fund managers' superior abilities to time market and select securities in periods of higher volatility in financial markets. As a matter of fact, it is well documented in the mutual fund literature that active fund managers exhibit different market timing abilities and security selection skills in the crisis and non-crisis periods. For example, Muñoz et al. (2014) find that SR mutual fund managers, particularly in the U. S. market, possess superior managerial abilities (i.e., stock-picking, market-timing, and style-timing) to achieve better performance in crisis periods than normal periods. In other close studies, Moskowitz (2000) and Oliveira et al. (2019) also find that active managers add value, as they perform exceptionally well in poor economic states. Given that our samples of SR ETFs employ passive investing strategies and have little influence of fund managers, there is no surprise that we do not observe the superior performance of SR ETFs over their conventional counterparts during market downturns.

Why do SR ETFs underperform non-SR ETFs in normal business periods but not in crisis periods? One possible explanation is that the portfolio diversification benefit may only work well in non-crisis periods but not during recessions and market crises (Patev et al., 2006). Brunnermeier et al. (2020) claim that systematic shocks are more pronounced during the bust periods, and hence, the increasing risks of collapse of an entire financial system or economy threaten to hit all of the securities in the markets with full force. Particularly in the 2008 financial meltdown and the 2020 pandemic crisis, systemic risk had wreaked havoc across markets and firms, unleashing the sudden economic recession and stock market crash. In this case, even a well-diversified portfolio might not be able to deliver significantly higher returns than other funds. On the other hand, the concerns over the unsystematic risks are likely to prevail in non-crisis periods in which diversification costs resulting from the constrained set of socially responsible investments tend to dampen the performance of SR ETFs.

4.3 | The fund-level panel data regression analysis

The baseline analysis above relies on the calendar-time portfolio approach to compute the alphas for both SR ETFs and conventional ETFs. We use this approach to examine the performance differences of socially responsible and conventional ETFs on an equally weighted portfolio basis. In this subsection, we conduct the robustness check by calculating the rolling daily alphas for each sample fund and performing the fund-level panel data regression analysis. Specifically, for each individual fund, we run Model (1), (2), or (3) on rolling regressions over 250-day windows by using its trailing 250 daily returns to estimate factor loadings; then we compute its rolling daily alphas as the difference between realized returns and estimated returns. After obtaining a panel data of sample ETF daily alphas, we finally run the following regression specification to examine whether SR ETFs perform differently from their counterparts in the full sample periods. Different from our previous calendar-time portfolio approach, such a fund level panel regression analysis could allow us to fully incorporate the information in individual fund abnormal returns, and flexibly control the impact of fund characteristics on the differences in fund performance.[16]

$$\begin{aligned} alpha_{i,t} = a + b_1 SRI_i + c_1 \text{Log}\left(Fund\ age\right)_{i,t} + c_2 \text{Log}\left(Manager\ tenure\right)_{i,t} + c_3 \text{Log}\left(Fund\ size\right)_{i,t} \\ + c_4 \text{Turnover}_{i,t} + c_5 \text{Expense}_{i,t} + c_6 \text{Liquidity}_{i,t} + c_7 \text{Log}(\text{Family size})_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

where $\text{alpha}_{i,t}$ is our dependent variable for fund i at time t. It is the rolling risk-adjusted return for each individual fund calculated by three different models (the CAPM model, the Fama–French-Carhart 4-factor model, and the Fama–French 5-factor model) and is based on daily returns across the past 12 months. SRI is a dummy variable that equals 1 if the fund is identified as a socially responsible investment and 0 otherwise. Our control variables include: Fund age, defined as the difference in years between current date and the date the fund was first

TABLE 6 The fund-level panel data regression analysis

	Dependent variables		
Explanatory variables	**CAPM alpha**	**Carhart 4-factor alpha**	**FF5 alpha**
SRI	−0.00012***	−0.00011***	−0.00008**
	(−2.84)	(−2.59)	(−2.24)
log(Fund age)	−0.00005	0.00000	−0.00006
	(−0.76)	(0.06)	(−0.86)
log(Manager tenure)	−0.00001	−0.00004	0.00001
	(−0.16)	(−0.63)	(0.11)
log(Fund size)	0.00007*	0.00007*	0.00007*
	(1.76)	(1.79)	(1.71)
Turnover	0.00002**	0.00002*	0.00003**
	(1.97)	(1.65)	(2.30)
Expense	−0.00008	−0.00008	−0.00007
	(−0.58)	(−0.56)	(−0.42)
Liquidity	−0.00161**	−0.00129*	−0.00121**
	(−2.05)	(−1.86)	(−1.98)
log(Family size)	0.00000	−0.00000	0.00000
	(0.07)	(−0.03)	(0.07)
_cons	0.00013	−0.00001	0.00007
	(0.67)	(−0.06)	(0.35)
Year fixed effects	Yes	Yes	Yes
Investment Style	Yes	Yes	Yes
Fund family fixed effects	Yes	Yes	Yes
Adj R-square	0.10	0.11	0.09

Note: This table reports the estimation results of Model (5) in which alpha is the dependent variable. Alpha is the rolling abnormal return for each individual ETF estimated by three different models (the CAPM, the Fama–French-Carhart 4-factor model, the Fama–French 5-factor model). SRI is a dummy variable that equals 1 if the fund is identified as a SR ETF and 0 otherwise. The *t*-statistics are presented in parentheses, calculated with robust standard errors clustered at the fund family level. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

offered; Manager tenure, the difference in years between the current date and the date when the current manager took control; Fund size, the total net assets under management ($mm); Turnover, defined as the minimum of aggregated sales or aggregated purchases of securities divided by the average of the total net assets of the fund; Expenses, the expense ratio; Liquidity, measured as the difference between closing ask and bid quotes divided by the bid-ask midpoint; and Family size proxies the total assets under management for all the members of a fund family. Our models include year fixed effects, style variables, and fund family fixed effects to capture unobserved fund characteristics that may affect a given market segment in a particular year, informal fund culture, and formal fund family policies (Amihud & Goyenko, 2013; Tufano & Sevick, 1997). In all cases, we calculate robust standard errors adjusted for clustering at the fund family level to reflect potential coordination of policies within each family.

In Table 6, we present the estimated results of Model (5). We find that the coefficients on SRI are significantly negative at least at the 5% level, regardless of the choice of factor alphas. These results reveal that, on the individual fund level, each SR ETF underperforms its counterparts by 0.008%–0.012% per day (or 2%–3% annually) on average.

This result is in line with our observations of the previous calendar-time portfolio analysis though the magnitude of the underperformance of SR ETFs is smaller on the average individual fund level. We also find that the funds with larger size, higher turnover rate, or more liquidity generally report bigger abnormal returns.

To examine the heterogenous effects caused by the market crisis across ETFs, we also include a crisis dummy and an interaction term of the SRI dummy and crisis dummy in Model (5). Our regression specification is:

$$\begin{aligned} alpha_{i,t} = a + b_1 SRI_i + b_2 SRI_i * D_{C,t} + b_3 D_{C,t} + c_1 \text{Log}\left(Fund\ age\right)_{\text{i,t}} + c_2 \text{Log}\left(Manager\ tenure\right)_{\text{i,t}} \\ + c_3 \text{Log}\left(Fund\ size\right)_{\text{i,t}} + c_4 \text{Turnover}_{\text{i,t}} + c_5 \text{Expense}_{\text{i,t}} + c_6 \text{Liquidity}_{\text{i,t}} \\ + c_7 \text{Log(Family size)}_{\text{i,t}} + \varepsilon_{i,t} \end{aligned} \quad (6)$$

where $D_{C,t}$ is a dummy variable that equals 1 if t falls in the crisis period and 0 otherwise. While $D_{C,t} = 0$, b_1 captures the performance difference between SR ETFs and their counterparts during the non-crisis periods; While $D_{C,t} = 1$, $(b_1 + b_2)$ measures how much SR ETFs $(b_1 + b_2 + b_3)$ perform differently from their counterparts (b_3) during the crisis periods. Similarly, we include year fixed effects, style variables, and fund family fixed effects in the model, and we calculate robust standard errors adjusted for clustering at the fund family level.

As shown in Table 7, we observe that, regardless of the choice of factor alphas, b_1 is significantly negative and b_2 is significantly positive while the sum of b_1 and b_2 is insignificant in both economic and statistical terms. For example, the first column of Table 7, which uses CAPM-based alphas as the dependent variables, displays a negative coefficient of −0.00026 on SRI with t-value of −4.57. This reveals that each SR ETF yields worse performance than the conventional fund by 0.026% on a daily basis during non-crisis periods. A significantly positive coefficient of 0.00031 on the interaction term of SRI and the crisis dummy seems to suggest that that SR ETFs substantially improve their performance in times of crises by 0.031% each day on average. However, we find no evidence that SR ETFs outperform their counterparts during the market crash as the sum of b_1 and b_2 is equal to 0.00005 with t-value of 0.32. This indicates that investors' behaviors in SR ETFs cannot be explained by the prospect theory utility model since those socially conscious investors do not simply give up some returns in non-crisis periods in order to pursue higher abnormal returns in crisis periods (as Nofsinger & Varma, 2014 observed in the mutual fund markets). Overall, our analysis at the individual fund level presents consistent results with compared to our baseline analysis of the portfolio approach.

4.4 | The fund flow-past performance relation

To provide additional evidence on the role of non-pecuniary attributes that has played in investors' decision-making, we examine the relationship between net fund flows and past fund performance. If investors in SR ETFs attach more interest in socially responsible or ethical objectives than in fund performance, we expect that SR ETFs' fund flows would be less related to the past fund performance. In this subsection, we employ the same methodology by Bollen (2007) and Renneboog et al. (2011) and investigate the sensitivity of SR ETFs' net fund flows to the past fund performance:

$$Net\ Flow_{i,t} = a + \left(b_1 R^+ + b_2 R^-\right) Return_{i,[t-1,t-12]} + \left(b_3 R^+ + b_4 R^-\right) Return_{i,[t-1,t-12]} * SRI_i + c_1 \text{SRI}_{\text{i}} + c_2 \text{Controls}_{\text{i,t}-1} + \varepsilon_{i,t} \quad (7)$$

where $Net\ Flow_{i,t}$ is net fund flow of fund i in month t divided by asset under management (AUM) of fund i in month $t-1$; $Return_{i,[t-1,t-12]}$ is the average raw return, average CAPM-adjusted return, average FFC four-factor adjusted return, or average FF five-factor adjusted return of fund i over the months $t-1$ to $t-12$; and R^+ and R^- are dummy variables that take the value of one if the average return is non-negative or negative, respectively; and SRI_i is a dummy variable that equals one if fund i is an SR investment fund and zero otherwise; $\text{Controls}_{i,t-1}$ is the vector of control variables, including fund age, manager tenure, fund size, turnover, expense, liquidity, and return volatility.

TABLE 7 The heterogenous effects caused by the market crisis

	Dependent variables		
Explanatory variables	**CAPM alpha**	**Carhart 4-factor alpha**	**FF5 alpha**
SRI (b_1)	−0.00026*** (−4.57)	−0.00023*** (−3.76)	−0.00027*** (−4.79)
SRI * $D_{c,t}$ (b_2)	0.00031** (2.56)	0.00028*** (2.77)	0.00042*** (3.50)
$D_{c,t}$	0.00003 (0.34)	−0.00011 (−1.45)	−0.00013* (−1.75)
log(Fund age)	−0.00005 (−0.74)	0.00001 (0.08)	−0.00006 (−0.84)
log(Manager tenure)	−0.00000 (−0.09)	−0.00003 (−0.54)	0.00001 (0.27)
log(Fund size)	0.00007* (1.70)	0.00007* (1.72)	0.00007 (1.62)
Turnover	0.00002 (1.54)	0.00001 (1.22)	0.00002* (1.70)
Expense	−0.00008 (−0.61)	−0.00009 (−0.59)	−0.00007 (−0.45)
Liquidity	−0.00166** (−2.05)	−0.00130* (−1.85)	−0.00124** (−1.99)
log(Family size)	0.00000 (0.06)	0.00000 (0.02)	0.00000 (0.05)
_cons	0.00015 (0.79)	0.00001 (0.03)	0.00009 (0.48)
$b_1 + b_2$	0.00005 (0.32)	0.000044 (0.31)	0.00015 (1.08)
Year fixed effects	Yes	Yes	Yes
Investment style	Yes	Yes	Yes
Fund family fixed effects	Yes	Yes	Yes
Adj. *R*-square	0.12	0.14	0.12

Note: This table reports the estimation results of Model (6) in which alpha is the dependent variable. Alpha is the rolling abnormal return for each individual ETF estimated by three different models (the CAPM, the Fama–French-Carhart 4-factor model, the Fama–French 5-factor model). SRI is a dummy variable that equals 1 if the fund is identified as a socially responsible investment and 0 otherwise. $D_{C,t}$ is an indicator that equals 1 if t falls in the crisis period and 0 otherwise. The t-statistics are presented in parentheses, calculated with robust standard errors clustered at the fund family level. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

The definitions of those control variables are presented in Model (5). We also include style variables, year fixed effect, and fund family fixed effect to control for unobserved differences in money flows. Also, we calculate robust standard errors adjusted for clustering at the fund family level to reflect potential coordination of policies within each family.

Given the construction of the dummy variables, we define that b_1 measures the sensitivity of flows to positive average returns over the previous year for conventional ETFs, and b_2 captures the sensitivity of flows to negative average returns over the previous year for conventional ETFs. On the other hand, the sum of b_1 and b_3 measures the sensibility of flows to positive average returns for SR ETFs, and the sum of b_2 and b_4 captures the sensitivity of flows to negative average returns for SR ETFs.

TABLE 8 The fund flow-past performance relation

Explanatory variables	Raw return	CAPM alpha	Carhart 4-factor alpha	FF5 alpha
Return $*R^+$	1.95081***	21.02872***	19.99873***	23.82501***
	(7.96)	(3.83)	(3.82)	(4.12)
Return $*R^-$	1.38926***	27.51254***	26.89979***	27.21532***
	(2.91)	(4.03)	(4.20)	(3.98)
Return $*R^+ *$ SRI	−0.74405**	−4.92388	−3.14081	−7.89142
	(−2.27)	(−0.71)	(−0.47)	(−1.14)
Return $*R^- *$ SRI	−0.94192**	−15.06767**	−14.72484**	−16.39195**
	(−2.04)	(−2.27)	(−2.38)	(−2.51)
SRI	0.01873	0.02679**	0.02585**	0.02784**
	(1.39)	(2.45)	(2.39)	(2.54)
log(Fund age)	−0.01852***	−0.02179***	−0.02193***	−0.02161***
	(−2.98)	(−3.16)	(−3.16)	(−3.14)
log(Manager tenure)	−0.01005*	−0.00872	−0.00873	−0.00899
	(−1.74)	(−0.40)	(−0.40)	(−0.42)
log(Fund size)	0.00624	0.00749*	0.00746*	0.00754*
	(1.56)	(1.89)	(1.88)	(1.90)
Turnover	0.00263	0.00252	0.00252	0.00249
	(0.70)	(0.66)	(0.66)	(0.65)
Expense	0.00100	−0.00620	−0.00625	−0.00605
	(0.10)	(−0.62)	(−0.63)	(−0.61)
Liquidity	0.05271	−0.06440	−0.06858	−0.08266
	(0.49)	(−0.76)	(−0.82)	(−0.99)
Return Volatility	−0.00223**	−0.00115	−0.00106	−0.00148
	(2.32)	(−0.77)	(−0.70)	(−1.00)
log(Family size)	0.00016	0.00019	0.00019	0.00021
	(0.14)	(0.18)	(0.17)	(0.20)
_cons	0.10320*	0.12470**	0.12768**	0.12576**
	(1.87)	(2.24)	(2.28)	(2.28)
Year fixed effects	Yes	Yes	Yes	Yes
Investment style	Yes	Yes	Yes	Yes
Fund family fixed effects	Yes	Yes	Yes	Yes
Adj. *R*-square	0.05	0.04	0.04	0.04

Note: This table reports the estimation results of Model (7) in which the money flow of fund *i* in month *t* is the dependent variable. Columns (1)–(4) show the results with different measures of past performance. The explanatory variables are lagged by 1 month. The *t*-statistics are presented in parentheses, calculated with robust standard errors clustered at the fund family level. *, **, and *** stand for the significance levels at the 10%, 5%, and 1% thresholds, respectively.

Table 8 reports the estimated results of Model (7). In column (1), for example, we find that the fund inflows to conventional ETFs increase 1.95% per month for every 1% increase in the previous year's average monthly return when the lagged return is positive. While following a negative average return, the fund outflows from conventional ETFs increase 1.39% for every 1% decrease in prior year return. In contrast, the coefficients of b_3 and b_4 are both significantly negative at the 5% level, suggesting that investors in SR ETFs are less sensitive to past fund performance than conventional investors. Particularly, money outflows from SR ETFs only rise by a modest 0.45% $(b_2 + b_4)$ per month for every 1% slump in previous year return when lagged returns are negative. That is, those socially

responsible investors are less willing to withdraw money from poorly performing funds than are conventional investors. We also find similar results while utilizing CAPM adjusted returns, FFC four-factor model adjusted returns, or FF five-factor model adjusted returns to measure prior fund performance. Although the sensitivity of SR fund flows to past positive performance (b_3) is insignificant in column (2), (3), and (4), there is strong evidence that the flows of SR ETFs are significantly less sensitive to past negative performance than are those of conventional ETFs. That is, socially conscious investors are less concerned about past financial performance than are conventional investors as they also take into account nonfinancial attributes in their investment decision, which further supports our main hypothesis in this article.

In addition, we include a crisis dummy and the interaction term of crisis dummy and $(R^+ + R^-)Return_{i,[t-1,t-12]} * SRI_i$ in model (7) in order to examine whether the economic downturn has impacted the sensitivity of SR fund flows to past performance. In untabulated results, we find no evidence that the flow sensitivity of SR ETFs to past performance varies over the crisis periods.

5 | CONCLUSIONS

In spite of the growing awareness over environmental, social, and governance values, it is still unclear how the rise of socially responsible investing strategies has an impact on the financial market development. In particular, do SR funds produce better performance than conventional funds? If not, why have SR funds become more and more attractive in the market?

Using the CAPM, 4-factor model (Carhart, 1997) and 5-factor model (Fama & French, 2015), we document that SR ETFs yield significantly negative abnormal returns (alphas), as compared with conventional ETFs. Specifically, SR ETFs underperform conventional peers by 0.019%–0.022% per day, depending on the specifications. These results differ from the findings in actively managed mutual funds (e.g., Bauer et al., 2005; Derwall & Koedijk, 2009; Kreander et al., 2005; Nofsinger & Varma, 2014). We attribute the contrasting findings to the nature of mutual fund performance studies that are subject to the joint test for the SR investment strategies and managerial skills. Using ETFs, we are able to mitigate the confounding effect by separating the SR investment filter from active fund management strategies.

In contrast to conventional ETFs, we find that SR ETFs are substantially exposed to small caps, more growth-oriented (less value-oriented), less profitable, and more aggressive investing firms. Furthermore, we study alphas during crisis and non-crisis periods and find that SR ETFs only underperform conventional ETFs during non-crisis periods. Our results remain robust to the fund-level panel data regression analysis.

In addition, we document that investors in the SR ETFs are less responsive to negative financial performance than are investors in conventional ETFs. In other words, SR investors are willing to invest in an ethical and socially responsible way despite relatively poor fund performance. This, in turn, implies that SR investors also consider nonfinancial attributes in their investment decisions.

In summary, our findings lend support to the non-financial utility hypothesis that SR investors seek to achieve their utility by investing in firms that share similar ethical and socially responsible beliefs (e.g., Bollen, 2007; Hood et al., 2013; Renneboog et al., 2008; Renneboog et al., 2011; Statman, 2004). Unlike conventional investors, socially conscious investors are more likely to pursue social values in addition to wealth-maximization. We provide evidence that SR investing vehicles integrate economic utility with ethical practices. Provided that SR investors incorporate ethical standards in their investment, it is of great importance to weigh the social value-expressive feature in future behavioral asset pricing models.

ENDNOTES

[1] The 2020 report of the sustainable investing forum, https://www.ussif.org/trends

[2] According to Agudelo et al. (2019), the new perspective of corporate social responsibility (CSR) emphasizes that corporations enhance their competitive edges via a strategic method that brings the creation of shared value in term of benefit

for the whole society while improving the firm's competitiveness. And more and more companies felt the pressure to embrace CSR in their operations as socially responsible investment has become a key investment philosophy adopted by a large proportion of institutional investors in the financial markets (Sparkes & Cowton, 2004).

[3] Our sample of SRI ETFs employ the passive investing strategies. Around 85% of these SRI ETFs are categorized as index funds.

[4] In Nofsinger and Varma's (2014) sample, 93% of the socially responsible investing sample are actively managed mutual funds.

[5] One strand of studies argues that there are some non-financial attributes in socially responsible investing, and socially conscious investors may explicitly derail from the rational wealth-maximization by pursuing those ethical objectives. The non-financial attributes are also known as the causes of the heterogeneity of SRI. Sandberg et al. (2009) document four levels on which SRI heterogeneity can be formed: the terminological, definitional, strategic and practical.

[6] https://www.reuters.com/article/us-global-funds-sustainable/sustainable-fund-assets-hit-record-1-7-trln-in-2020-morningstar-idUSKBN29X2NM

[7] https://www.morningstar.com/articles/1026261/us-sustainable-funds-continued-to-break-records-in-2020

[8] All the data provided by Steele Database comes from Morningstar, Inc. It currently includes over 30,000 mutual funds and ETFs in its database. Similar to Morningstar database, Steele identifies the SRI funds with socially responsible investing objectives and strategies. A socially conscious fund may take a proactive stance by selectively investing in, for example, environmentally friendly companies, or firms with good employee relations. This group also includes funds that avoid investing in companies involved in promoting alcohol, tobacco, or gambling, or in the defense industry. We also include funds with liquidations and mergers in the historical database.

[9] In our final sample, 85% of the SRI ETFs are categorized as index funds. All of our passively managed ETFs have low expense ratios, ranging from 0.1% to 0.79%.

[10] The average daily rate of returns of the S&P 500 index is 0.032% during the same sample period.

[11] As pointed out by Nofsinger and Varma (2014), this restriction helps prevent the matched conventional fund performance from being dominated by a few large fund families. However, as mentioned by the unknown reviewer, the performance difference between SRI and conventional ETFs may be caused by differential family-level characteristics. Hence, as a robustness check, we develop a new sample of conventional ETFs by matching each SR ETF to a conventional ETF by fund family, fund age, fund size, and investment objectives. The empirical results in Section 4 remain fairly similar. To conserve space, we do not report those results but they are available from the authors on request.

[12] We follow majority of prior studies to define our crisis periods. As a robust check, we also identify the 2008 financial turmoil and the 2020 Covid Pandemic for the stock market based on the peak and trough for the S&P 500 Index (i.e., December 2007 to June 2009 and February 24, 2020 to April 20, 2020) and we obtain similar empirical results.

[13] The statistical insignificance could be an artifact of the lack of power resulting from the small sample size in the crisis periods.

[14] In Nofsinger and Varma's (2014) sample, 93% of the socially responsible investing sample are actively managed mutual funds.

[15] Nofsinger and Varma (2014) demonstrate that during the crisis period alphas are economically (but not statistically) positive for both SRI and non-SRI mutual funds and the alpha differences are significantly higher than zero. They argue that SRI mutual funds achieve superior performance in the crisis period because the attributes of socially responsible and ethical investing reduce the potential downside risk in bear markets.

[16] The authors thank an unknown referee for suggesting including this method as the robustness check in our analysis.

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