

# What is the Price of a Clear Conscience? The Performance of Socially Responsible Investments in the BRICS Countries\*

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## Abstract

We investigate the performance of socially responsible investments (SRI) in the BRICS countries (Brazil, Russia, India, China and South Africa), thus covering a major part of emerging markets, compared to the US, and the UK. From a methodological point of view we highlight a potential pitfall in using *current* holdings of ethical mutual funds for the historical analysis of socially responsible investing, which may cause a potential look-ahead bias. Based on *current* holdings SRI in the BRICS countries significantly outperform their benchmarks. However, we find that using *historical* holdings substantially reduces the outperformance of SRI in BRICS countries and it becomes insignificant. Our results thus lend support to a “no effect” hypothesis of SRI in emerging markets.

***JEL classification:***

***Keywords:*** *Socially Responsible Investing, BRICS, Emerging Markets, Mutual Fund Holdings, Look-ahead Bias*

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# What is the Price of a Clear Conscience? The Performance of Socially Responsible Investments in the BRICS Countries

## 1. Introduction

During the last decade the importance of socially responsible investments (hereafter SRI) has substantially increased. SRI as we know them today find their origins in the political climate of the United States in the 1960s (Bauer et al., 2005). The amount of money these funds collected from investors grew at a spectacular rate: According to *The Forum for Sustainable and Responsible Investment*, as of year-end 2011, \$3.74 trillion was invested using socially responsible investment strategies in the United States alone. This means more than one out of every nine dollars under professional management in the U.S., can be classified as socially responsibly investments (Forum for Sustainable and Responsible Investment, 2012).

The definition of socially responsible investments (also: ethical investments) varies greatly. The Social Investment Forum (2005, p.2) describes socially responsible investing as “*an investment process that considers the social and environmental consequences of investments, both positive and negative, within the context of rigorous financial analysis.*” Hudson (2005, p.642) understands it as “*the use of non-financial normative criteria by investors in the choice of securities for their portfolios.*” Socially responsible investors generally use both positive and negative investment criteria. Many will, for example, exclude all companies that are involved in the production or distribution of alcohol, tobacco, and weapons (see Hong and Kacperczyk, 2009). Positive criteria, in contrast, include environmental soundness, good employee relations, and support for local communities.

Given the increasing importance of SRI there has been a huge interest by investors, the financial industry, and researchers in the impact of SRI on investors' returns, i.e. whether there is a difference in the performance of SRI and traditional investments.

However, from a theoretical perspective neither the existence nor the sign of a performance difference is obvious. Hamilton et al. (1993) and Statman (2000) formulate three competing hypotheses about the performance of SRI relative to other stocks: The first hypothesis is the '*no effect*' hypothesis, stating that SRI neither underperform nor outperform other stocks. This implies that socially responsible investors do not reduce the cost of capital to socially responsible firms (Rivoli, 2003). The second hypothesis, the '*doing good but not well*' hypothesis, implies SRI underperform relative to conventional stocks, because socially responsible investors drive down the cost of capital of socially responsible firms (see Heinkel et al., 2001, for a theoretical model) or because of agency problems and increased information asymmetry (Jensen, 2002). Finally, the third hypothesis the '*doing good while doing well*' hypothesis states that SRI outperform conventional investments, because investors underestimate the benefits of socially responsible investments<sup>1</sup> relative to their costs (Marsh, 2000).

The question which of these hypotheses holds is an empirical one and accordingly there have been numerous attempts to evaluate the performance of SRI. The majority of existing studies analyze developed markets, and there appears to be some consensus that the 'no effect' hypothesis holds for major markets. Although SRI have also found their way to emerging economies in recent years, evidence for these markets remains rare. The focus in these regions has primarily been on growth, rather than elements of sustainability. However, in the past few years, SRI have gradually found their way to some emerging economies, with a focus on the BRICS countries.

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<sup>1</sup> Paine (2000) mentions reductions in coordination and monitoring costs, transaction cost advantages, increased engagement and creativity of employees, avoidance of political costs and higher reputation of ethical firms, which should all translate into economic value.

Brazil's first ethical mutual fund was launched in 2001, followed by the Bovespa Corporate Sustainability Index ISE in 2005. Since then the interest in SRI has steadily increased. In contrast, SRI in Russia has only recently gained attention, but is expected to become more important in the future. In January 2008 the S&P ESG India Index was launched. This index includes fifty stocks, selected from the five hundred largest companies on India's National Stock Exchange. For the selection process, environmental, social, and corporate governance factors are quantified and translated into scores. The companies that attain the highest ESG scores, are added to the index (Standard and Poor's 2011).

In China, there have been some developments on the ethical investment scene in recent years. The country's first SRI fund, the Xingquan SRI Fund, was established in 2008, and by the end of 2012, it had \$870 million assets under management (Zhang 2014). In South Africa the Johannesburg Stock Exchange introduced its JSE SRI index in 2004, with 82 constituents in 2015.

Our contribution to the literature is threefold: First, we add to the rare literature on the performance of SRI in emerging economies by looking at the BRICS countries (Brazil, Russia, India, China, and South Africa), which are the biggest and most important emerging countries. The potential of these countries is easily captured when considering that they give a home to almost 40% of the world population, while generating 21% of world GDP and constituting 15% of the world's stock market capitalization. While previous studies focused on one or two of these countries, we are to the best of our knowledge the first to consider the full group and therefore the major part of the emerging market investment universe.

Second, this paper contributes to the body of existing literature by using an approach that differs from most previous studies. While most studies have analyzed SRI performance by comparing the returns of ethical mutual funds to those of a broad market index (there are few exceptions, such as Hill et al., 2007)), we build self-composed portfolios of socially

responsible stocks. As a result, we avoid some of the pitfalls of working with net-of-fee return data on mutual funds, such as the impact of fund transaction costs, managerial skills, or timing activities of the fund management, which are not necessarily filtered out. This makes it a much more direct way to determine the added value of SRI screening (Schröder, 2007). By analyzing the performance of self-composed portfolios, the impact of SRI screens can be measured almost directly.

Third, related to the second contribution to the literature and in contrast to previous studies on SRI using mutual funds' portfolio holdings, we correct for a look-ahead bias inherent in an approach that uses *current* portfolio holdings. By using current portfolio holdings, the researcher relies on information not available when investors are reasonably expected to construct the portfolio under consideration. In particular, the use of current holdings limits the selection universe to those stocks that are currently being held by the mutual fund and thereby excludes all companies that were part of the portfolio but that went out of business during preceding years. This implies that there is a real danger of survivorship bias.

In order to avoid this potential pitfall, and to examine what the impact of survivorship bias might be, this study examines the performance of two portfolios for each geographical region. For each region, one portfolio is created by selecting stocks from the *current* holdings of ethical mutual funds, as done in existing work (see inter alia in Hill et al., 2007). On top of that another portfolio is created by selecting stocks from the *historical* holdings of ethical mutual funds. The latter is free of the look-ahead bias we identify in this study. We show that the benefits of SRI are substantially smaller than shown in previous studies, but still there is no underperformance of SRI.

The rest of the paper proceeds as follows. In the subsequent section we review the existing literature on both developed and developing markets. Section 3 discusses the data, while

Section 4 presents the empirical approach. Section 5 discusses the results and Section 6 summarizes and concludes.

## **2. Review of the Literature**

There are three approaches to assess the performance of SRI: One may analyze the investment performance of mutual funds, or the performance of an SRI index or the performance of a self-constructed portfolio.

A large body of the literature on socially responsible investing examines the potential benefits of socially responsible investing using return data on ethical mutual funds. Since mutual funds are the main vehicle through which investors can invest in a socially responsible manner, ethical mutual funds are a natural starting point in investigating the benefits of SRI.

The extant research that uses data on mutual funds suggests some disagreement on whether SRI are profitable. Research asserts that ethical mutual funds either do not exhibit any performance difference vis-à-vis traditional mutual funds (see inter alia Hamilton et al., 1993; Statman, 2000; Cummings, 2000; Schröder, 2004; Bauer et al., 2005, Kreander et al., 2005) or, quite to the contrary, outperform conventional mutual funds (see Moskowitz, 1972; Luther et al., 1992; Mallin et al., 1995; Travers, 1997; Geczy et al., 2005). On the other hand a few studies find clear underperformance of ethical mutual funds compared to conventional mutual funds (see Mueller, 1991; Tippet, 2001). The ambiguity of empirical results may stem from some methodological problems in using mutual funds' return data.

The main limitation in using net-of-fee return data on ethical mutual funds, both in developed and emerging markets, follows from the difficulty in disentangling the benefits from socially responsible investing from the potential contribution of the fund manager. This implies that we cannot rule out the possibility that any observed superior performance of SRI

is to a certain extent due to the manager's security selection or market timing skills. At the same time, management fees charged by mutual funds for actively managing the portfolio can hamper our ability to pick up the potential benefits from SRI. We can imagine a situation in which SRI yields abnormal returns before fees, but in which the fund manager captures these rents through fees. This is in line with a general observation from mutual funds (Fama and French, 2010).

Using stock data on companies deemed socially responsible through a screening process or portfolio holdings of ethical mutual funds allows researchers to better analyze the question of how SRI are priced.

A direct analysis of socially responsible stocks bypasses the potential impact that active portfolio management and management fees might have on our results. Here, two approaches have been suggested that allow a more direct assessment of the benefits of SRI. The first string of literature constructs SRI portfolios using *SRI indices or SRI databases*. Kempf and Osthoff (2007), for instance, use the KLD Research & Analytics SRI database and find that socially responsible companies' stocks outperform stocks of 'shunned' industries. Similarly, Statman and Glushkov (2009) also rely on the KLD database and find that a tilt toward socially responsible portfolios gives the portfolios an advantage over conventional portfolios.

A second, more limited, string of literature employs mutual fund *holdings* to assess the benefits of SRI. A major advantage of this approach lies in the fact that, while SRI indices and SRI databases such as KLD are generally only available for all markets, data on mutual funds' emerging market holdings are more readily available. In light of the present analysis, where we focus on emerging markets, we therefore opt for an approach based on funds' portfolio holdings. This implies we implicitly rely on the fund managers' screening and exclusion criteria. This is attractive as we are using a practical classification which avoids the need to put forth a self-constructed definition of Corporate Social Responsibility (CSR). At

the same time, relying on mutual funds' selection criteria leaves open the possibility that the reader might consider some stocks in the sample more socially responsible than others. However, given that all the stocks passed the screening process of at least one ethical mutual fund company, the stocks can be regarded as being part of the universe of socially responsible investment possibilities.

The literature using funds' holdings is limited. One of the first studies to use the approach is Hill et al. (2007). The authors take a long-term perspective to socially responsible investing and find that, while SRI stock portfolios do not exhibit any significant risk-adjusted outperformance over a 3 or 5-year investment horizon, they do significantly outperform the market portfolio over a 10-year investment horizon.

The use of active ethical mutual funds' *current* holdings to assess the potential benefits of SRI can, however, potentially lead to upward biased results when the performance analysis is based on the historical performance of that particular portfolio of securities. This is because the information contained in current holdings introduces a look-ahead bias which will potentially lead us to overestimate performance.

It is easy to see why this might be the case. First we note that current holdings reflect information not available at the time of the portfolio formation that is implicit in a performance analysis, inducing a look-ahead bias<sup>2</sup>. The impact can be substantial as a mutual fund's current holdings are the outcome of the securities' *past* performance. Second, bad performing stocks will also drop out simply when they become delisted or are taken over. In addition, mutual funds might be tempted to sell underperforming stocks as a means of window dressing. In the case of active mutual funds, the funds' performance will arguably not have been bad. Since stocks that failed as well as stocks that underperformed and were

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<sup>2</sup> Incidentally, companies that are considered socially responsible at present might not have been viewed as such historically. However, our present analysis focusses on a performance-related issue induced by the look-ahead bias and not on other potential issues that might arise from using a classification of companies using ethical mutual funds' current holdings.

sold do not show up in a mutual fund's current holdings, we are left with a subset of the investment universe that performed well historically, and test whether these performed well historically. Obviously, the above identified look-ahead bias induces a survivorship bias. To avoid this potential pitfall, we should evaluate mutual funds' portfolio holdings *going forward*. While this is not possible when relying on mutual funds' current holdings, such an analysis is possible when we rely on the funds' *historical* portfolio holdings.

We note that, in a context where a researcher uses only information on currently active mutual funds, there is also the risk of survivorship bias at the level of the mutual fund universe. As such, it is likely that we are still overestimating the degree of outperformance. Due to data limitations, that will become evident in the next section, we leave this topic for further research.

The vast majority of the studies on SRI focus on the U.S. A few studies focus on the U.K. and other European countries. However, research on other regions is rare. Sandberg et al. (2009) note that besides data availability cultural differences might explain this focus on developed Western economies. The U.S. and the U.K. have the longest SRI traditions and the highest assets-under-management. Both elements facilitate research on the topic and might explain researchers' preference for these markets.

While the literature investigating the performance of SRI in emerging markets remains scant, the increasing popularity of SRI globally has led to the emergence of some literature. For example, Chapple and Moon (2005) analyze social responsibility in seven Asian countries and find that social responsibility varies considerably between these countries. Zhang and Rezaee (2009) analyze the relationship between company reputation and profitability in China. They find that more credible firms tend to perform better. Similarly, Cheung, Jiang, and Tan (2012) analyze the relationship between corporate social responsibility and the firm valuation of companies in the Fortune 100 of largest listed

companies in China. The authors use a self-constructed CSR index and find that financial markets reward firms with improving corporate governance practices.

For Brazil, Hartz, Dimas, Lemme, and Leal (2014) conclude, based on a sample of 11 Brazilian ethical mutual funds, that SRI in Brazil does not come at a cost.

South Africa has, in the past, received considerably more attention in the SRI literature, albeit in a somewhat different context. During apartheid, divestments from the country were considered a prime example of socially responsible investing (see Hamilton et al., 1993; Mallin et al., 1995). More recently, with the emergence of SRI in South Africa, Heese (2005) and Sonnenberg and Hamann (2006) discuss the development of SRI in South Africa. Viviers et al. (2008) assess the performance of South African ethical funds and find that these funds initially underperformed their benchmark, but gradually exhibited improved performance.

Finally, for Russia and India we were unable to find any existing literature on the benefits of SRI. To the authors' best knowledge, no literature exists that provides a comprehensive analysis of the benefits of socially responsible investing in the BRICS. This paper attempts to fill this void.

### **3. Data**

We analyze SRI in the five BRICS countries Brazil, Russia, India, China and South Africa as well as the U.S. and the U.K. The latter serve as a control group and have been chosen because of their long tradition in SRI and because they are the subject of most empirical studies.

In line with Hill et al. (2007), the data collection process for the purpose of our analysis requires that we identify ethical funds whose portfolio holdings can be used to analyze SRI. In the case of the U.S. and the U.K., we collect the current holdings of the largest ethical mutual funds (based on assets-under-management at the end of 2014). In the case of ethical

mutual funds that focus on the emerging markets, as expected, we find that there are fewer funds focusing on these regions as compared to their Western-oriented counterparts. Nevertheless, for all the countries of interest we are able to find at least three currently active ethical funds that contains companies for the set of countries we examine.

In Table 1 we report the set of funds used to construct the SRI portfolios based on *current* holdings.

[insert Table 1 about here]

The information contained in Table 1 illustrates that we collect a set of companies that are considered to be acting socially responsible both from ethical mutual funds with a strict focus on one particular country, as well as from mutual funds that have an international focus. This means that several of the ethical funds we collect contain useful information on more than one of the countries we examine. Concurrently, using the same ethical funds to construct SRI portfolios for different countries has the additional benefit that it to some extent ensures that the definition of what is considered social responsibility remains more or less homogenous across the countries in the sample.

While it is fairly easy to obtain information with regard to the *current* holdings of active ethical funds, retrieving *historical* data on funds' portfolio holdings is more challenging. In particular, while SRI are well-established in developed markets, it is only a fairly recent phenomenon in some of the emerging markets we wish to consider. At the same time, we need sufficiently long track-records to be able to perform a meaningful analysis. This implies that we need to ensure that we incorporate ethical funds with sufficiently long track-records for which historical information on their holdings is available.

Mutual funds do not typically report historical holdings and this also holds true for the funds in Table 1<sup>3</sup>. To solve this issue and obtain historical holdings, we rely on the *U.S. Securities and Exchange Commission's EDGAR*<sup>4</sup> database. This database contains filings from publicly traded U.S. companies. Mutual funds, too, are required to disclose a full list of their holdings every quarter. This information is made publicly available through *EDGAR* and remains accessible for a considerable period of time. For the purpose of composing portfolios that are free of look-ahead bias, we searched the database for two types of forms, *Form 13F* and *Form N-Q*<sup>5</sup>.

To collect data we search the EDGAR database for the *13F* and *N-Q* forms of more than thirty well-known socially responsible mutual funds. After going through all the filings and dropping funds whose reporting history is deemed too short (we restrict ourselves to mutual fund holdings that allow us to construct portfolios with a holding period of at least 5 years), 20 investment funds remain for the further examination. Their filings date back to the period between 2004 and 2006. Data from EDGAR were supplemented with data from Bayón et al. (2003).

The set of mutual funds is the result of finding a balance that trades off several data-related aspects. We aim to keep the sample as large as possible, maximizing the track-record. Table 2 provides an overview of the funds whose *historical* holdings were used.

[Insert Table 2 about here]

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<sup>3</sup> Neither the funds' own websites, nor those of large investment research companies such as Morningstar Inc. or Bloomberg L.P. could provide the necessary information.

<sup>4</sup> *EDGAR*, the Electronic Data Gathering, Analysis, and Retrieval system, is a system that collects and validates submissions by companies and others who are required by law to file forms with the U.S. *Securities and Exchange Commission (SEC)*.

<sup>5</sup> First, *SEC Form 13F* is a quarterly filing by institutional investment managers who hold \$100 million or more in assets. The document provides information about the investment managers and sometimes a list of their holdings. Second, *SEC Form N-Q* is a mandatory document filed with the *Securities and Exchange Commission* by investment management companies. It includes a complete listing of their portfolio holdings.

We collect data on the equities from ethical funds' current and historical holdings using *Thomson Reuters Datastream*. We retrieve total return data, which assumes all dividends are reinvested. Monthly returns for the set of stocks are calculated in the following way

$$r_t = \frac{RI_t}{RI_{t-1}} - 1$$

where  $RI_t$  refers to the value of the return index at time  $t$ .

For each of the geographical regions under consideration we construct two equal-weighted SRI portfolios from the list of stocks based on the ethical funds' holdings. We select stocks to construct representative portfolios based on the ethical mutual funds top holdings, meaning that our portfolios are based on the most commonly held company names in the ethical funds' holdings (similarly to Hill et al., 2007). We fix the number of constituents in every portfolio to 20 stocks to ensure that the portfolios are similarly and sufficiently well diversified. This number of stocks is also close to the number of stocks we are able to obtain for most of the emerging markets, given the limited data available.

Our analysis covers a total of 266 stocks, which are approximately evenly divided across the current and historical holdings-based portfolios. The only country for which we were unable to obtain the proposed number of constituents is Russia. Table 3 provides a number of descriptive statistics on the SRI portfolios<sup>6</sup>.

[insert Table 3 about here]

The first set of portfolios draws on ethical funds' *current* portfolio holdings. The second set of portfolios is based on the *historical* holdings of ethical funds. As such, the first set of portfolios uses an approach in the spirit of Hill et al. (2007) and investigates the historical

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<sup>6</sup> For brevity, we do not report the full list of stocks included in the portfolios. These are, however, available upon request.

performance of ethical funds' current portfolios. The latter portfolios, we hope, should provide a more out-of-sample approach to investigating the benefits of SRI.

It is important to note that we are always comparing portfolios that cover the same investment period. As such, any differences in performance cannot be explained by for example an increasing popularity in SRI that might drive up demand and which, *ceteris paribus*, would drive up the securities' prices and thus lower expected returns over time.

Data for the asset pricing factors are collected from various sources. The proxies for the risk-free rate in this study are the three-months U.S. Treasury Bill rate for the U.S. market, the three-months U.K. Treasury Bill rate for the British market, and the ninety-one-day India Treasury Bill rate for the Indian market. Monthly data for these interest rates are retrieved from Thomson Reuters Datastream. For South Africa, Russia, and China, we employ the monthly risk-free rate provided by Jason Hsu. The risk-free rate for Brazil is retrieved from Stefano Marmi's Data Library<sup>7</sup>.

The size, value and momentum factors are obtained from various sources. For the U.S. market, we use the factors provided by Kenneth French's Data Library. The factors for the U.K. are obtained from Gregory, Tharayan, and Christidis (2013). The Indian market factors come from Agarwalla, Jacob, and Varma (2013). For Brazil, we use the factors made available by Stefano Marmi. Finally, for South Africa, Russia, and China we employ the emerging markets factors provided by Jason Hsu.

Limited by data availability issues, our final sample covers the period 2004-2014 for the U.S., the U.K., and India. For China, Brazil, Russia, and South Africa, the sample is somewhat shorter, with the sample period varying from 2006/2007 through 2011/2013 depending on the country. The sample length is therefore in line with the empirical literature, which commonly covers samples of 3-5 years.

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<sup>7</sup> The data of Stefano Marmi is available for download at [http://homepage.sns.it/marmi/Data\\_Library.html](http://homepage.sns.it/marmi/Data_Library.html). The data of Jason Hsu can be obtained at <http://www.jasonhsu.org/research-data.html>

#### 4. Methodology

A first analysis of SRI portfolios' performance is based on their Sharpe ratio. In particular, we test whether the difference in Sharpe ratio of the SRI portfolios and the market portfolio is statistically significant.

The empirical literature testing the statistical significance of differences in Sharpe ratios generally uses the test of Memmel (2003), which is a corrected version of the test suggested by Jobson and Korkie (1981). However, since Memmel's test is not robust against autocorrelation, fat tails, and other small sample biases, Ledoit and Wolf (2008) suggest two potential solutions.

The first correction is based on heteroskedasticity and autocorrelation robust (HAC) kernel estimation, the standard approach used to solve the above issues with financial return data. However, Ledoit and Wolf (henceforth LW) show that, for small and moderate sample sizes, a studentised time series bootstrap is preferable. This second correction leads to an improved inference accuracy compared to standard inference based on asymptotic normality. Given the limited sample size in our sample, this is an important consideration.

The statistical procedure suggested by LW tests equality of the Sharpe ratios of two portfolios

$$H_0: \Delta = Sh_i - Sh_b = 0$$

where  $Sh_i$  is the true Sharpe ratio of the SRI portfolio of stocks from the country and  $Sh_b$  is the true Sharpe ratio of the benchmark portfolio  $n$  of the country under consideration. The approach of LW consists of constructing a symmetric studentised time series bootstrap

confidence interval. If zero is contained in the interval, then the two Sharpe ratios are not significantly different.

To construct the interval, one needs to approximate the two-sided distribution of the studentised difference via a distribution obtained from  $M$  bootstrap resamples. Algebraically,

$$\mathcal{L}\left(\frac{|\widehat{\Delta} - \Delta|}{s(\widehat{\Delta})}\right) \approx \mathcal{L}\left(\frac{|\widehat{\Delta}^* - \widehat{\Delta}|}{s(\widehat{\Delta}^*)}\right)$$

where  $\Delta$  is the true difference between the Sharpe ratios,  $\widehat{\Delta}$  is the estimated difference computed from the original data,  $s(\widehat{\Delta})$  is the standard error for  $\widehat{\Delta}$  (also computed from the original data),  $\widehat{\Delta}^*$  is the estimated difference computed from the bootstrap data, and  $s(\widehat{\Delta}^*)$  is a standard error for  $\widehat{\Delta}^*$  (also computed from the bootstrap data). Finally,  $\mathcal{L}(\chi)$  denotes the distribution of the random variable  $\chi$ . Letting  $z_{|\cdot|,\lambda}^*$  be a  $\lambda$  quantile of  $\mathcal{L}\left(\frac{|\widehat{\Delta}^* - \widehat{\Delta}|}{s(\widehat{\Delta}^*)}\right)$ , a bootstrap  $1 - \alpha$  confidence interval for  $\Delta$  is then given by

$$\widehat{\Delta} \pm z_{|\cdot|,1-\alpha}^* s(\widehat{\Delta}).$$

When the data is heavy-tailed or for data of time series nature this quantile will typically be somewhat larger than  $(1 - \alpha/2)$ -quantile of the standard normal distribution in small or moderate samples, resulting in more conservative inference compared to the HAC method.

To generate bootstrap data in the case of time series data, LW use the circular block bootstrap of Politis and Romano (1992). The approach consists of resampling blocks of pairs from the observed pairs of returns  $(r_{ti}, r_{tn})$ ,  $t = 1, \dots, T$ , with replacement. These blocks have a fixed size  $b \geq 1$ . LW propose a calibration procedure to optimally select the fixed block size  $b$  from a predefined range of reasonable block sizes<sup>8</sup>. We refer the reader to Ledoit and Wolf (2008) for a description of their algorithm.

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<sup>8</sup> We consider candidate block sizes of 1,3,6,10,15. The actual block size is allowed to vary from country to country.

The standard error  $s(\widehat{\Delta})$  is computed based on HAC kernel estimation using the prewhitened quadratic spectral kernel of Andrews and Monahan (1992). The standard error  $s(\widehat{\Delta}^*)$  is the natural standard error computed from the bootstrap data, making use of the special block dependence structure; see Götze and Künsch (1996) for more details.

The test, as described above, is carried out by constructing a bootstrap confidence interval with confidence level  $1 - \alpha$ . We can reject the null hypothesis if zero is not contained in the interval. However, it might be more desirable to obtain a  $p$ -value. We use the shortcut described by Ledoit and Wolf to construct  $p$ -values. Denote the original studentised test statistic by  $d$ , that is,

$$d = \frac{|\widehat{\Delta}|}{s(\widehat{\Delta})}$$

Next, denote the centered studentised statistic computed from the  $m$ th bootstrap sample by  $d^{*,m}$ ,  $m = 1, \dots, M$ , that is,

$$\tilde{d}^{*,m} = \frac{|\widehat{\Delta}^{*,m} - \widehat{\Delta}|}{s(\widehat{\Delta}^{*,m})},$$

Where  $M$  is the number of bootstrap resamples. Then the  $p$ -value is computed as

$$PV = \frac{\{\tilde{d}^{*,m} \geq d\} + 1}{M + 1}$$

For the purpose of our analysis, we perform  $M = 5000$  bootstrap sequences.

Comparing portfolios based solely on their Sharpe ratios has one important shortcoming. It does not allow us to condition on some well-known risk factors that help explain stock returns. In other words, higher loadings on certain risk factors might explain the difference in Sharpe ratios. Therefore, we also evaluate the performance of the SRI portfolios relying on the standard asset price framework used in the asset pricing literature. Whereas most of the existing literature that evaluates SRI employs a simple capital asset pricing model (a notable

exception is Bauer et al., 2005) to estimate Jensen's alpha, we improve on the existing literature by using a multiple regression with additional risk factors.

In particular, we perform Fama and French (1993) style regressions augmented with Carhart's (1997) momentum factor. Formally, we estimate the following set of regressions

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_{1,p}RMRF_t + \beta_{2,p}SMB_t + \beta_{3,p}HML_t + \beta_{4,p}MOM_t + \epsilon_{p,t}$$

where  $R_{p,t}$  is the return on the SRI portfolio at time  $t$ ,  $R_{f,t}$  is the risk-free rate at time  $t$ ,  $RMRF_t$  is the excess return on the overall market at time  $t$ ,  $SMB_t$  is the small-minus-big market capitalization factor in period  $t$ ,  $HML_t$  is the high-minus-low book-to-market factor in period  $t$ , and  $MOM_t$  is the cross-sectional momentum factor at time  $t$ . To analyze performance of SRI it is important to employ appropriate risk factors which capture the factors described by Fama and French (1993) and Carhart (1997). To account for any possible time-series autocorrelation in the residuals, we use the procedure suggested by Newey and West (1986) to estimate standard errors for the regression coefficients.

## 5. Results

We start by reporting summary statistics on the set of socially responsible investment portfolios. Table 4 reports the Sharpe ratios for the SRI portfolios based on ethical funds' current holdings and for the respective country's market index. The Sharpe ratios are displayed for the seven countries under consideration and for the BRICS countries in total.

[Insert Table 4 about here]

It is evident from Table 4 that SRI portfolios based on ethical funds' current holdings would have provided a better risk/return trade-off than the benchmark portfolio. In particular,

an SRI portfolio outperformed the broad market index in each of the countries under consideration. The same applies to the full sample of stocks from BRICS countries. We also observe quite some variability among the different BRICS countries, .

Applying the Ledoit-Wolf test, we find that the difference in the Sharpe ratio between the SRI and benchmark portfolio is statistically significant in the case of the U.S., U.K., India, and China as well as for the full BRICS portfolio. In addition, the difference in Sharpe ratio is marginally significant in the case of Brazil. While the difference in Sharpe ratios between the SRI portfolio and the benchmark portfolio is also positive in the case of Russia and South Africa, the difference is not significant at any conventional level. The generally lower statistical significance might to some extent be the result of the shorter sample size in the case of the BRICS countries.

Next, we focus on the results for the SRI portfolios that are based on ethical mutual funds' historical portfolio holdings. The results are displayed in Table 5.

[Insert Table 5 about here]

The results for SRI portfolio based on historical holdings suggest a pronounced drop in the SRI portfolios' Sharpe ratios. This indicates that whether the sample construction is based on current or on historical holdings has a substantial impact on the results. In particular, all Sharpe ratios drop uniformly across developed and emerging markets. For all series, the obtained  $p$ -value suggests that the SRI portfolio does not yield a more attractive risk/return trade-off than the market portfolio. In two cases (U.S. and South Africa) the market portfolio even provides a higher Sharpe ratio than the SRI portfolio. The largest, although not significant, difference is obtained for the full BRICS sample.

In Figure 1, we visualize the change in Sharpe ratio when moving from portfolios based on current holdings to portfolios based on historical holdings.

[Insert Figure 1 about here]

Significant differences in the Sharpe ratios of the different portfolios can also stem from our portfolio construction approach. In particular, since we use equal-weighted portfolios, following Hill et al. (2007), small capitalization stocks get a higher weight. As a consequence, the different performance vis-à-vis a broad market index, which is a value-weighted index, can be the result of a size effect.

To provide a more comprehensive analysis of the risk-adjusted performance of the SRI portfolios, we estimate a standard Fama-French 3-factor model, augmented with Carhart's momentum factor. The results are reported in Table 6 and Table 7 for the SRI portfolios based on current and historical holdings, respectively.

[Insert Table 6 about here]

The results for the SRI portfolios based on ethical funds' *current* holdings uniformly point to a positive alpha for the countries under consideration. The alpha is significant at conventional levels in the case of the U.S., the U.K., the full BRICS sample, India, and China. In the case of South Africa and Brazil, the results suggest that the alpha becomes marginally significant. Again, the insignificance of the point estimates might to some extent stem from the relatively short sample size in the case of the emerging market SRI portfolios. It is remarkable that the alphas for all BRICS countries exceed those of the developed markets in size. For the full BRICS sample we retrieve a (significant) alpha, which is twice as large as those (also significant) for the US and the UK.

Turning to the economic significance of the point estimates we find that they suggest considerable outperformance. In particular, the estimates suggest an outperformance ranging

from 5% p.a. in the case the U.K. to up to approximately 24% p.a. in the case of China. For the full set of BRICS countries it mounts up to about 10%.

[Insert Table 7 about here]

Next, we analyze the portfolios that employ ethical funds' historical holdings. The picture changes markedly. While still positive, all of the estimated alphas no longer appear significant at conventional levels. To better grasp the impact of the approach used to construct SRI portfolios on their performance, we plot the point estimates of the alphas of the two sets of portfolios in Figure 2.

[Insert Figure 2 about here]

A cursory inspection of the Figure illustrates a uniform change in the estimated alphas. In particular, portfolios based on historical holdings uniformly post lower alphas of similar magnitude.

Clearly, the conclusions we are able to draw on the performance of SRI are sensitive to the way in which we evaluate socially responsible companies' stock performance. Avoiding a potential look-ahead bias that follows from using current holdings, our results based on historical holdings lend support to the "no effect" hypothesis of SRI.

At this point, it is also worth linking back to the earlier results of Hill et al. (2007), in an attempt to explain their earlier findings. The authors observe that extending the investment horizon of their analysis increases the estimated alpha of the portfolio of socially responsible companies. Hill et al. (2007) interpret this finding as revealing superior long-term financial performance by socially responsible firms.

While it is true that the performance of the set of securities investigated by Hill et al. (2007) was better than that of the market portfolio, we believe that the outperformance is inflated by the look-ahead and survivorship bias. In particular, by extending the investment

horizon, we expect that the upward bias in the performance statistics caused by survivorship increases. This is consistent with the observed pattern in the results by Hill et al. (2007).

## **6. Conclusion**

The importance of socially responsible investments has grown immensely over the past decade. Both in Europe and the United States, SRI now represent a substantial part of all funds under professional management. While smaller in the BRICS countries, SRI in these countries are also gaining ground quickly. As a result, it has become essential for investors with a global perspective to comprehend whether stocks selected by an SRI screening process perform differently from those selected by conventional portfolio selection approaches.

In this paper, we investigate whether there is a price for SRI in BRICS countries. The answer to this question is important because it determines the benefits from international diversification for investors seeking ethical investments outside the developed markets.

Our results suggest that investing in a socially responsible way, while constraining the opportunity set of available securities, does not necessarily result in a lower return. This gives strong support to the ‘no effect’ hypothesis and limits the view held by many that investments in ethical stocks will give below market returns (Mackenzie and Lewis, 2000).

Furthermore we show that the choice of current versus historical holdings substantially affects the results: While the more realistic use of historical holdings gives support to the ‘no effect’ hypothesis, using current holdings overestimates the returns of SRI due to a survivorship bias and leads to a spurious outperformance of SRI.

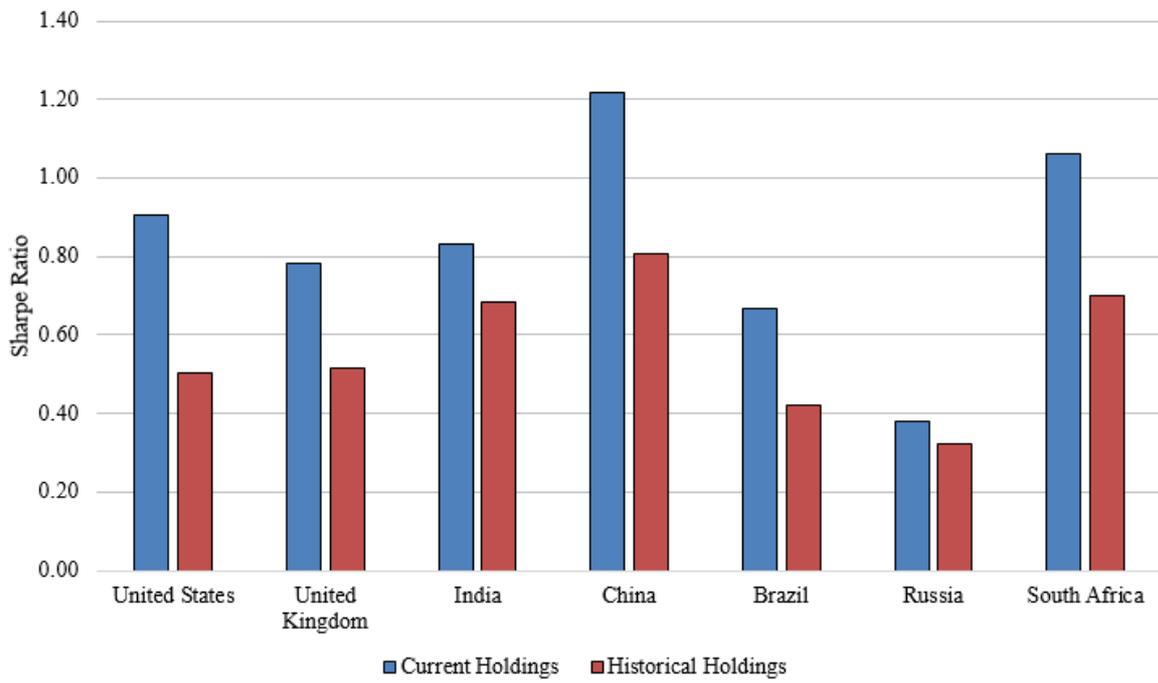
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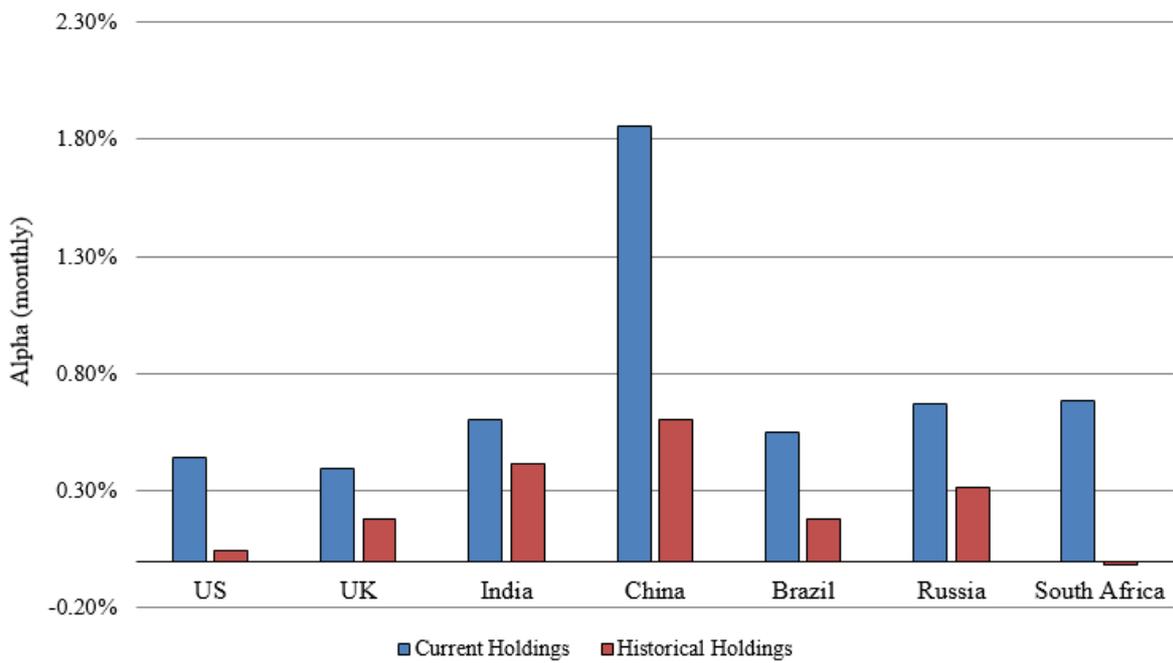
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**Figure 1: Comparison Sharpe Ratios: Current versus Historical Holdings**



**Figure 2: Four-factor alpha Comparison**



**Table 1: List of Ethical Mutual Funds - Current Holdings**

<b>Fund</b>	<b>U.S.</b>	<b>U.K.</b>	<b>Brazil</b>	<b>Russia</b>	<b>India</b>	<b>China</b>	<b>South Africa</b>
Aberdeen Ethical Engagement UK Fund		x					
Aberdeen Responsible UK Equity Fund		x					
Alliance Trust Sustainable Future UK Growth		x					
Calvert Emerging Markets Equity Fund			x	x	x	x	x
Calvert Equity Portfolio	x						
Calvert International Equity Fund							x
Calvert International Opportunities Fund			x	x			x
CIMB S&P Ethical Asia Pacific Dividend ETF						x	
DFA Emerging Markets Social Core Equity			x	x	x	x	x
Domini Social Equity Fund	x						
Ecclesiastical Amity UK B fund		x					
Fundo Ethical			x				
Huitianfu SRI Fund						x	
Impax Asian Environmental Markets IRL						x	
Jupiter Responsible Income Fund		x					
Kames Ethical Cautious Managed fund		x					
MMA Praxis International A						x	
Neuberger Berman Socially Responsible Fund	x						
Parnassus Core Equity Fund	x						
Pax World Growth A	x						
S&P ESG India Index					x		
Scottish Widows Ethical fund		x					
Sovereign Ethical fund		x					
Sparinvest Ethical Emerging Markets Value						x	
Xingquan SRI Fund						x	

**Table 2: List of Ethical Mutual Funds - Historical Holdings**

<b>Fund</b>	<b>U.S.</b>	<b>U.K.</b>	<b>Brazil</b>	<b>Russia</b>	<b>India</b>	<b>China</b>	<b>South Africa</b>
Aberdeen World Ethical Fund			x				
Calvert International Equity Fund	x	x			x		
Calvert International Opportunities Fund			x				
Calvert Social Investment Fund	x						
Calvert World Values International Equity Fund			x	x			x
Community Gilt Fund							x
Community Growth Fund							x
CVS Calvert Social International Equity Portfolio				x			x
DFA Emerging Markets Social Core Portfolio			x				
Domini European Social Equity Trust		x					
Domini Pacasia Social Equity Trust						x	
Fraters Earth Equity Fund							x
Fundo Ethical			x				
Glebe Pan Asian Growth Trust						x	
Kingsway China Fund						x	
MMA Praxis International Fund		x	x	x	x	x	
S&P ESG India Index					x		
The Futuregrowth Albaraka Equity Fund							x
United Global UNIFEM Singapore Fund						x	
Utopia Core Fund			x		x	x	

**Table 3: Descriptive Statistics SRI Portfolios**

	U.S.		U.K.							
	<i>Curr.</i>	<i>Hist.</i>	<i>Curr.</i>	<i>Hist.</i>						
Mean Return	1.10%	0.74%	0.90%	0.66%						
St Dev.	4.46%	5.26%	4.16%	4.63%						
Skewness	-0.64	0.03	-0.36	-0.18						
Kurtosis	2.89	4.29	0.76	1.99						
Min	-18.31%	-19.79%	-10.45%	-14.94%						
Max	13.96%	23.92%	13.30%	17.54%						
# holdings	20	20	20	20						

	India		China		Brazil		Russia		South Africa	
	<i>Curr.</i>	<i>Hist.</i>								
Mean Return	2,28%	2,06%	2,60%	1,76%	2,12%	1,64%	1,56%	1,52%	2,34%	1,46%
St Dev.	7,85%	8,24%	9,49%	9,60%	6,34%	5,69%	12,66%	15,54%	5,29%	4,24%
Skewness	0,07	0,11	-1,02	-0,38	0,48	-0,18	-0,68	-0,12	-0,50	-0,36
Kurtosis	2,16	1,85	1,74	1,91	2,24	1,19	2,11	3,53	-0,08	0,46
Min	-21,65%	-23,32%	-27,98%	-29,72%	-15,58%	-18,41%	-38,76%	-48,96%	-11,63%	-10,31%
Max	34,42%	34,86%	19,40%	26,84%	24,80%	18,65%	30,82%	43,98%	11,71%	10,39%
# holdings	20	20	20	20	20	20	18	8	20	20

*Notes:* This Table report summary statistics for the set of socially responsible investment portfolios. ‘*Curr.*’ refers to portfolios based on ethical mutual funds’ current holdings, whereas ‘*Hist.*’ refers to portfolios based on ethical mutual funds’ historical holdings. The Table reports the mean monthly return, the standard deviation of the mean monthly return, the returns’ skewness and kurtosis, and the minimum and maximum monthly return. All statistics reported are based on returns in local currency.

**Table 4: Summary Statistics SRI Portfolios based on *current* holdings**

Country	Period	SRI Portfolio			Market Portfolio			LW test	
		Mean Excess	Std. Dev. Mean Excess	Sharpe Ratio	Mean Excess	Std. Dev. Mean Excess	Sharpe Ratio	difference	<i>p</i> -value
United States	2004-2014	1.10%	4.46%	0.91	0.64%	4.22%	0.55	0.36***	0.005
United Kingdom	2004-2014	0.90%	4.16%	0.78	0.54%	4.00%	0.48	0.30***	0.002
BRICS	2007-2011	1.37%	8.13%	0.63	0.35%	8.38%	0.15	0.48***	0.008
India	2004-2014	1.72%	7.89%	0.83	1.16%	7.21%	0.59	0.24*	0.085
China	2006-2011	2.84%	9.46%	1.22	1.14%	7.76%	0.54	0.68**	0.038
Brazil	2004-2013	1.15%	6.36%	0.67	0.36%	5.66%	0.23	0.44	0.129
Russia	2007-2011	1.50%	14.76%	0.38	0.35%	8.38%	0.15	0.23	0.439
South Africa	2004-2011	2.41%	9.00%	1.06	1.38%	6.71%	0.77	0.29	0.507

*Notes:* This table reports the monthly mean excess return, the monthly standard deviation of mean excess returns, and the annualized Sharpe ratio for the SRI portfolios and the market portfolio for every country. We also report the *p*-value of the difference in Sharpe ratios for the Ledoit-Wolf (LW) test for equal Sharpe ratios.

**Table 5: Summary Statistics SRI Portfolios based on *historical* holdings**

Country	Period	SRI Portfolio			Market Portfolio			LW test	
		Mean Excess	Std. Dev. Mean Excess	Sharpe Ratio	Mean Excess	Std. Dev. Mean Excess	Sharpe Ratio	difference	<i>p</i> -value
United States	2004-2014	0.74%	5.26%	0.50	0.64%	4.22%	0.55	-0.04	0.744
United Kingdom	2004-2014	0.66%	4.63%	0.51	0.54%	4.00%	0.48	0.03	0.832
BRICS	2007-2011	1.02%	8.68%	0.43	0.35%	8.38%	0.15	0.28	0.111
India	2004-2014	1.51%	8.28%	0.69	1.16%	7.21%	0.59	0.09	0.559
China	2006-2011	1.99%	9.57%	0.81	1.14%	7.76%	0.54	0.26	0.314
Brazil	2004-2013	0.67%	5.70%	0.42	0.36%	5.66%	0.23	0.20	0.426
Russia	2007-2011	1.53%	17.85%	0.32	0.35%	8.38%	0.15	0.18	0.568
South Africa	2004-2011	1.50%	8.06%	0.70	1.38%	6.71%	0.77	-0.07	0.827

*Notes:* This table reports the monthly mean excess return, the monthly standard deviation of mean excess returns, and the annualized Sharpe ratio for the SRI portfolios and the market portfolio for every country. We also report the *p*-value of the difference in Sharpe ratios for the Ledoit-Wolf (LW) test for equal Sharpe ratios.

**Table 6: Multifactor Regressions: Portfolios Based on *Current* Holdings**

Variables	(1) US	(2) UK	(3) BRICS	(4) India	(5) China	(6) Brazil	(7) Russia	(8) South-Africa
$R_m - R_f$	0.995*** (0.030)	0.963*** (0.038)	0.902*** (0.0410)	0.936*** (0.044)	1.109*** (0.064)	0.916*** (0.084)	1.439*** (0.106)	1.055*** (0.074)
<i>SMB</i>	0.095* (0.052)	0.079* (0.045)	-0.0148 (0.211)	0.077 (0.055)	-0.409** (0.183)	0.494*** (0.122)	-0.524 (0.571)	-0.296 (0.186)
<i>HML</i>	-0.114** (0.054)	0.0753 (0.065)	0.243** (0.097)	0.155*** (0.040)	-0.149 (0.150)	0.247*** (0.080)	0.651** (0.263)	0.191 (0.209)
<i>MOM</i>	-0.114*** (0.038)	-0.021 (0.037)	-0.114*** (0.039)	-0.139*** (0.0405)	0.0405 (0.078)	-0.115** (0.05)	-0.331** (0.128)	0.0452 (0.101)
<i>alpha</i>	0.004*** (0.001)	0.004*** (0.001)	0.009** (0.003)	0.006*** (0.002)	0.019*** (0.006)	0.006 (0.004)	0.007 (0.011)	0.007 (0.006)
Observations	121	117	43	121	56	100	43	81
R-squared	0.940	0.925	0.951	0.906	0.848	0.677	0.839	0.705

*Notes:* This table presents statistics on SRI performance for the U.S., the U.K., India, China, Brazil, Russia, and South Africa. We measure the performance of SRI as the excess return of an equal-weighted portfolio of stocks that is based on ethical mutual funds' current holdings. We estimate Carhart's (1997) 4-factor model, which supplements the Fama and French (1993) 3-factor model with a cross-sectional momentum factor. The multiple regression model consists of the market excess return ( $R_m - R_f$ ), the small-minus-big factor (*SMB*), the high-minus-low factor (*HML*), and the momentum factor (*MOM*). All statistics are monthly.

The standard errors (in parentheses) are corrected using the Newey-West (1987) procedure. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 7: Multifactor Regressions: Portfolios Based on *Historical* Holdings**

Variables	(1) US	(2) UK	(3) BRICS	(4) India	(5) China	(6) Brazil	(7) Russia	(8) South-Africa
$R_m - R_f$	0.971*** (0.042)	0.972*** (0.044)	0.920*** (0.044)	0.949*** (0.044)	1.105*** (0.062)	0.884*** (0.073)	1.622*** (0.133)	0.948*** (0.059)
<i>SMB</i>	0.309*** (0.095)	0.296*** (0.057)	0.000 (0.196)	0.111* (0.067)	0.212 (0.170)	0.259** (0.120)	-0.612 (0.756)	-0.244 (0.176)
<i>HML</i>	0.195** (0.082)	0.121 (0.097)	0.238** (0.115)	0.161*** (0.048)	0.031 (0.162)	0.171** (0.073)	0.713* (0.367)	0.246 (0.186)
<i>MOM</i>	-0.089 (0.073)	-0.090** (0.040)	-0.242*** (0.073)	-0.193*** (0.041)	-0.059 (0.125)	-0.056 (0.050)	-0.651*** (0.237)	-0.058 (0.091)
<i>alpha</i>	0.000 (0.002)	0.00183 (0.001)	0.004 (0.004)	0.004 (0.003)	0.006 (0.006)	0.002 (0.003)	0.003 (0.013)	-0.000 (0.005)
Observations	121	117	43	121	56	100	43	81
R-squared	0.894	0.904	0.942	0.892	0.808	0.720	0.817	0.723

*Notes:* This table presents statistics on SRI performance for the U.S., the U.K., India, China, Brazil, Russia, and South Africa. We measure the performance of SRI as the excess return of an equal-weighted portfolio of stocks that is based on ethical mutual funds' historical holdings. We estimate Carhart's (1997) 4-factor model, which supplements the Fama and French (1993) 3-factor model with a cross-sectional momentum factor. The multiple regression model consists of the market excess return ( $R_m - R_f$ ), the small-minus-big factor (*SMB*), the high-minus-low factor (*HML*), and the momentum factor (*MOM*). All statistics are monthly.

The standard errors (in parentheses) are corrected using the Newey-West (1987) procedure. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$