Original Article

# Market-timing skills of socially responsible investment fund managers: The case of North America versus Europe

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**ABSTRACT** This study analyzes the market-timing skills of Socially Responsible Investment (SRI) fund managers based in North America (US & Canada) and Europe. We use a broad sample of 248 North American and 500 European SRI funds during the January 2001-December 2011 period. Our result indicates that market-timing skills exist in both regions and SRI funds are attractive investment instruments. Nonetheless, North American SRI funds are more attractive than the European SRI funds because fund managers from North America possess superior stock selection abilities and market-timing skills.

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**Keywords:** market-timing; socially responsible investing fund; North America; Europe

## INTRODUCTION

Over the years it has been well-documented that many mutual fund and hedge fund managers have tried to time the market with little success (for example, Jiang *et al*, 2007 and Gregoriou, 2003). However, mutual funds

have a tendency to exhibit signs of superior stock selection ability, but no market-timing skills. In short, market-timing is basically finding the exact time to invest and trying to outperform the general market. For example, Prigent (2007) defines market-timing as ' … a strategy linked to beta greater than 1 when the market is bullish, and smaller than 1 when the market is bearish'.

There are two forecasting skills for a fund manager, that is, stock selection ability to predict an individual stock movement and market-timing skill to predict general stock market movement. If a fund manager believes he can anticipate the future movements of the market, he can shift the composition of his portfolio between stocks and risk-free assets in accordance with the movement of the market. Fund managers will purchase more stocks in order for the portfolio to increase in value when the stock market is bullish. If his forecast is correct, the portfolio will attain a positive abnormal return and vice versa (Chen *et al*, 1992; Benos and Jochec, 2011). Suppose the general market movement will exhibit a downtrend (corrective movement), a fund manager that partakes in market-timing will purchase additional risk-free assets for his portfolio. Fund managers are considered well-informed investors and a great majority is unable to exploit market return predictability (Jiang *et al*, 2007). In addition, investors depend on the talent of fund managers to outperform the market index in exchange for the hefty management fees mutual funds charge their clients. If mutual fund managers are not successful at outperforming their benchmark, then it is obvious that buying index funds is the way to go to save on fees.

Socially Responsible Investment (SRI) funds have recently drawn a great deal of attention from investors and academicians because these funds are considered to provide less diversification for a portfolio. Investors must make a choice to invest in a portfolio which is a subset of assets (Ferruz *et al*, 2012). The rationale of a Socially Responsible Investment is 'doing good while doing well' as stated by Hamilton *et al* (1993) so as to provide investors with an opportunity to invest and contribute to the society at the same time. Moreover, many argue that SRI funds tend to produce lower returns compared with their conventional peers because SRI funds have limited investment opportunities as the investment strategy of this group of funds has to satisfy the environmental, social and governance (ESG) factors. In addition, research has found that SRI funds actually performed equally with traditional standard market benchmarks as the S&P 500 indicating that SRI funds can be considered as an alternative investment for investors who would like to contribute to society.

According to Markowitz (1952), a diversified portfolio should be made up of stocks with low correlation. However, the components of SRI funds are usually composed of stocks from similar industries. As a result during the portfolio formation process, these funds need to undergo a stringent screening process that eliminate a number of stocks due to social, ethical and governance considerations. Owing to the limited investment opportunity SRI funds have, there are restrictions imposed on the stock selection abilities of fund managers. Schröder (2004) and Bauer *et al* (2005) argue that SRI fund managers tend to breach their fiduciary duty to produce abnormal returns for the fund they manage. However, we propose that SRI fund managers can rely on market-timing skills to earn above average returns for the fund since stock selection abilities have been restricted. For instance, SRI fund managers with market-timing skills will include more stocks to their portfolio when the future general market is predicted to go up. Similarly, SRI fund managers will include more bonds to their portfolio when the market is predicted to go down.

Similar to mutual funds, SRI funds are managed by fund managers as well. For a fund manager to manage a fund well and to outperform his respective benchmark, it is

important to possess stock selection abilities and market-timing skills (Jiang, 2003). Thus, SRI fund managers must possess stock selection abilities in order to choose undervalued stocks to be included in the fund. This is because the component of the fund is made up of companies that satisfy the investment objective of the fund. In addition, market-timing skills are equally important for SRI fund managers to forecast general market movement. With market-timing skills, SRI fund managers are able to buy and sell stocks based on market trends in order to reap abnormal returns for the funds they manage. Without market-timing skills, SRI fund managers possess stock selection abilities and cannot predict trends precisely and simply wind up buying and selling stocks at the wrong time.

Studies on the market-timing skills of SRI fund managers are scant, with most of the market-timing studies dating back to the 1980s focus on mutual funds. Additionally, most studies are single country in nature and comparisons between countries have seldom been made as summarized in Renneboog *et al* (2008a). There is no comparative study between these two regions. To the best of our knowledge, this aspect has not been studied for SRI funds specifically for North America and Europe. Our contribution is the first paper that examines the market-timing skills of SRI fund managers for both regions. Nevertheless, North America and Europe are taking initiatives to promote SRI funds (Renneboog *et al*, 2008a).

As a result of the recent popularity and growth, SRI funds have been an important strategy since the United States and Europe are concerned about the 'doing good while doing well' concept. For instance, SRI regulations have been implemented to foster the growth of SRI. Germany has implemented the Renewable Energy Act that was imposed on closed-end funds requiring them to invest in wind energy in 1991. In Italy, the regulations enforced in 2004 require pension funds to disclose the Environmental, Social and Governance (ESG) factors to determine their investment decisions. As for France companies are required to publish the ESG factors they implement into their operations in their annual report. In the United States, Section 406 of the Sarbanes-Oxley Act, effective in July 2002, requires companies to disclose a written code of ESG factors adopted by their top management (Renneboog *et al*, 2008a). The rising importance of SRI assets in Europe as of 2011 was €6 763 347 million (European Sustainable Investment Forum, 2012) while in 2012 the United States it was US$1013 billion (US Sustainable Investment Forum, 2012). Considered as the two largest SRI markets in the world, Europe and North America display that the increasing market of SRI assets indicates the importance of SRI.

The article is organized as followed. The next section reviews the literature. The subsequent section explains the data and methodology. The penultimate section presents the main findings and discussions. Lastly, the final section concludes.

## LITERATURE REVIEW

We find four studies that investigate the market-timing skills of SRI fund managers (Kreander *et al*, 2005; Renneboog *et al*, 2008b; Ferruz *et al*, 2012; and Ang and Lean, 2013b). One of the earlier studies, Kreander *et al* (2005) investigate the performance of 60 European SRI funds from January 1995 to December 2001 using matched-pair analysis. The sample consists of 34 UK funds, 14 Swedish funds, eight German funds and four Dutch funds. Market-timing is examined for both SRI and conventional funds,[1] with positive significant market-timing skills displayed by SRI fund managers.

In a well-cited study, Renneboog *et al* (2008b) analyze the market-timing skills of SRI funds and conventional funds from January 1991 to December 2003 in Europe (Belgium, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway,

Sweden, Switzerland and the United Kingdom), North America (the United States and Canada) and Asia Pacific (Australia, Japan, Malaysia and Singapore) using the Treynor–Mazuy (1966) model. They find that SRI fund managers from the United Kingdom, the United States and continental Europe are able to time the market. However, Asia-Pacific fund managers are negative market-timers whereby the managers time the market in the wrong direction. In a more recent study, Ferruz *et al* (2012) investigate the market-timing skills of 50 US religious funds[2] from January 1994 to September 2010. They find no market-timing skills implying that fund managers only rely on stock selection abilities to obtain abnormal returns for religious funds.

In addition, Ang and Lean (2013b) investigate the market-timing skills of SRI fund managers in Luxembourg from January 2001 to December 2011. The authors find that SRI funds are conservative,[3] underperform the Luxembourg stock market index, possess market-timing skills and are able to forecast general stock market movements. The authors further reveal an interesting finding: market-timing skills exist with poor stock selection ability. With the few studies on the market-timing of SRI fund managers in both Europe and North America, there is no comparative study on the performance of SRI funds between these two regions and our study serves to bridge the gap.

## DATA

Our sample consists of 248 and 500 SRI funds in the North America and Europe respectively. The data is obtained from the Eurekahedge database which is widely used in hedge funds/SRI funds studies (Hakamada *et al*, 2007; Weng and Trück, 2011; Ang and Lean, 2013a, b). We use the January 2001 to December 2011 period because of the high percentage of SRI funds that were launched and remain active. We follow Jiang *et al* (2007) to include funds with at least 24 months of return series in order to provide a long enough return for regression analysis and to ensure reliable estimation. Dead funds are included to avoid survivorship bias. The one-month US T-bill is proxied for the risk-free rate, which is obtained from Datastream and according to Hassan *et al* (2010) represents the best riskless asset. In addition, the Eurekahedge SRI Funds Index (ESFI) is used as market benchmark (www.eurekahedge.com). We adopt the definition from the Eurekahedge website: 'The Eurekahedge SRI Fund Index applies a broad-SRI methodology, and currently includes share classes from all around the globe. The index incorporates funds across all three generations of SRI: first (negative screens), second (positive and negative screens) and third (thematic, ESG criteria). Number of Index constituents: 856 unique funds, including dead funds so as to avoid survivorship bias and includes those funds which are actively reporting'. Furthermore, the size, value/growth and momentum factors are obtained from Style Research.

The main characteristics of SRI funds are summarized in Figures 1–5. Figure 1 displays the domicile of North American SRI funds of which 72.2 per cent are from the United States and 27.4 per cent from Canada and 0.4 per cent from Bahamas respectively. Figure 2 shows the domicile of European SRI funds with 37.6 per cent from Luxembourg, 22.2 per cent from France, 8.6 per cent from the United Kingdom and 31.6 per cent from others.[4]

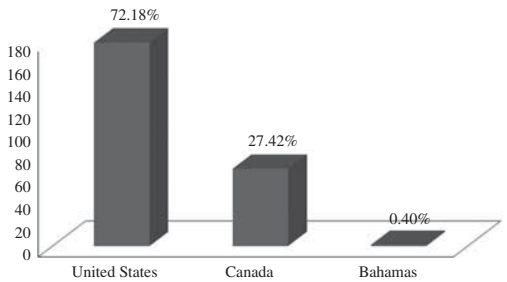


**Figure 1:** Distribution of SRI funds based on domicile in North America.

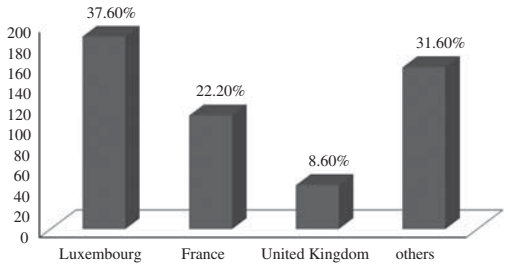


**Figure 2:** Distribution of SRI funds based on domicile in Europe.

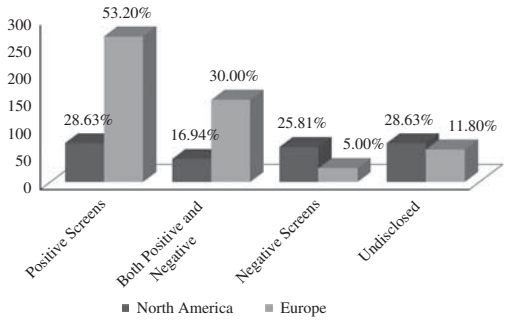


**Figure 3:** Distribution of SRI funds based on screening type.

Figure 3 displays the distribution of SRI funds based on the type of screening. In order to form the SRI portfolio, either a positive or a negative screening process needs to be undertaken or a simultaneous combination of both. A positive screening process selects stocks that are highly rated in terms of corporate social responsibility, whereas negative screening implies the exclusion of stocks from the formation of the portfolio because they do not satisfy social, environmental and ethical criteria. The North American funds have an even distribution on the screening type, whereas European funds tend to follow positive screening with more than 50 per cent of the funds. Only 5 per cent of the funds are negative screening.

Figure 4 shows the distribution of SRI funds based on instrument traded. Instruments traded refers to the financial and non-financial products that a fund invests in, for example, equities, commodities, currency, derivatives, fixed income products, cash, private equity, real estate, non-life insurance, life insurance and collectibles. Equity funds are the most popular followed by fixed income funds for both regions. According to Fama and French (1993), a fund is considered small in size if it is less than the median fund size. Based on our sample, the median fund size is US$ 81 million for North American SRI funds and US$ 64 million for European SRI funds respectively with a majority of the funds having less than US$ 100 million.

## METHODOLOGY

Carhart's (1997) Four-Factor model is employed to investigate the performance of SRI funds, given its common acceptance in the literature (Kempf and Osthoff, 2007; Jones *et al*, 2008 and Gil-Bazo *et al*, 2010). The Carhart (1997) model is as follows:

$$R_{it} - R_{ft} = \alpha + \beta_0 \left(R_{mt} - R_{ft}\right) + \beta_1 SMB_t + \beta_2 HML_t + \beta_3 MOM_t + \varepsilon_{it}$$

where $R_{it}$ is the return of fund $i$ at time $t$, $R_{ft}$ is the risk-free rate, $R_{mt}$ is the return of market benchmark; $SMB_t$ and $HML_t$ are the Fama and French (1993) size and book-to-market factors respectively. A stock with a low book-to-market ratio is a growth stock, while a stock with a high book-to-market ratio is a value stock. $MOM_t$ is the momentum return that was used in Carhart (1997) which denotes the return difference between portfolio of high returns stocks and low returns stocks. Alpha denotes the abnormal return of fund $i$. A positive alpha ($\alpha>0$) indicates that the fund outperforms the market benchmark, whereas a negative alpha ($\alpha<0$) indicates that the fund underperforms the market benchmark.

Next, we use the conventional Treynor-Mazuy (1966) and Henriksson-Merton (1981) models to address the issue of market-timing. The Treynor and Mazuy (1966)

  

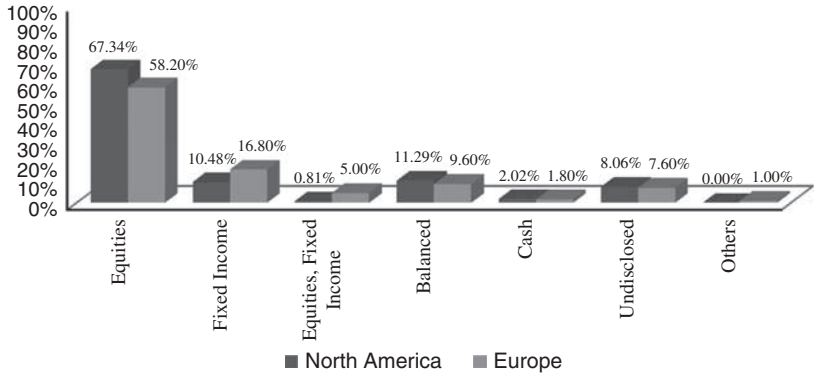


**Figure 4:** Distribution of SRI funds based on instrument traded.

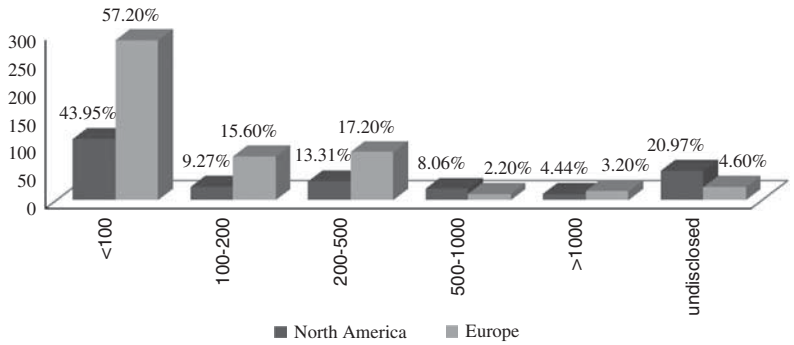


**Figure 5:** Distribution SRI funds based on fund size.

model is defined as:

$$R_{it} - R_{ft} = \alpha + \beta_0 \left(R_{mt} - R_{ft}\right) + \gamma \left(R_{mt} - R_{ft}\right)^2 + \varepsilon_t$$

where $R_{it}$ = return of fund $i$ at time $t$;
$R_{mt}$ = return of market or benchmark;
$R_{ft}$ = return of risk-free rate at time $t$;
$\varepsilon_t$ = error term.

Treynor and Mazuy (1966) capture the timing skill by including a quadratic term of the market index in the model, implying that a manager with market-timing skill will increase the beta during the up market and decrease it in a down market. 'If a fund manager is able to increase the fund's exposure to equities in advance of positive excess market returns, the portfolio will have a convex function of market return' (Bollen and Busse, 2005, p. 573).

Bollen and Busse (2005) interpret $\gamma$ as the change in a portfolio's beta due to the fund manager's timing activity. A significant positive gamma indicates that the fund manager exhibits positive market-timing skills. If gamma is negative and significant, it indicates that the fund manager times the market in the wrong direction. In other words, the fund manager forecasts the market to be higher in the future but in actuality the market is going downward. An insignificant gamma indicates that the fund manager does not possess positive market-timing skill. Thus, the null hypothesis is $\gamma = 0$ (no market-timing), alternative hypothesis is $\gamma > 0$ (market-timing skill exist).

Nonetheless, Henriksson and Merton (1981) improve upon the Treynor and Mazuy (1966) model by taking into account the hedge strategy in the model. Henriksson and Merton (1981) argue that the interpretation

of market-timing is the ability to incur an option in the market benchmark whereby the fund manager who wishes to time the market only needs to predict whether there is an uptrend ($R_m \geqslant R_f$) or a downtrend ($R_m \leqslant R_f$). The Henriksson-Merton (1981) model is defined as:

$$R_{it} - R_{ft} = \alpha_i + \beta_0 \left(R_{mt} - R_{ft}\right) + \gamma \max\left(0, R_{mt} - R_{ft}\right) + \varepsilon_t$$

Similar to the Treynor-Mazuy (1966) model, the significant positive gamma indicates that market-timing skill exists. Similarly, a negative or insignificant gamma implies the non-existence of timing skill.

Analogous to Bollen and Busse (2001, 2005), we incorporate *SMB, HML* and *MOM* factors into the conventional CAPM model. In such a way, the performance, style and manager's timing ability can be determined in a model. We explain the excess return of the fund by the Four-Factor Treynor-Mazuy (1966) and the Four-Factor Henriksson-Merton (1981) models. The Four-Factor Treynor-Mazuy (1966) model is defined as:

$$R_{it} - R_{ft} = \alpha + \beta_0 \left(R_{mt} - R_{ft}\right) + \gamma \left(R_{mt} - R_{ft}\right)^2 + \beta_1 SMB_t + \beta_2 HML_t + \beta_3 MOM_t + \varepsilon_t$$

where $SMB_t$ = the difference in return between small size and large size portfolios; $HML_t$ = the difference in return between value and growth portfolios; $MOM_t$ = the difference in return between past winner and past loser portfolios.

Similarly, the Four-factor Henriksson-Merton (1981) model is defined as:

$$R_{it} - R_{ft} = \alpha_{it} + \beta_0 \left(R_{mt} - R_{ft}\right) + \gamma \max\left(0, R_{mt} - R_{ft}\right) + \beta_1 SMB_t + \beta_2 HML_t + \beta_3 MOM_t + \varepsilon_t$$

A significant positive and greater than one of $(R_{mt} - R_{ft})$ indicates that the funds are aggressive funds whereas a significant positive but less than one means that the funds are conservative funds. A significant positive of $SMB_t$ indicates that size effect exists where the fund's return is tilted to the small portfolio. In other words, a small sized portfolio produces a larger return than the large sized portfolio. Furthermore, a significant positive of $HML_t$ indicates that the value effect exists whereby the fund's return is contributed by value stocks, whereas a significant negative of $HML_t$ indicates that growth effect exists where the funds return is tilted to growth stocks. Nonetheless, a significant positive of $MOM_t$ indicates that a momentum effect for stocks exists and implies that purchasing past winner's and selling past loser's produces a higher returns. However, a significant negative of $MOM_t$ implies that a contrarian strategy produces higher returns.

For robustness, we follow Bauer *et al* (2006) by over fitting the Treynor-Mazuy (1966) model with a cubic excess market return term to test the adequacy of the model. We apply the cubic model suggested by Jagannathan and Korajczyk (1986):

$$R_{it} - R_{ft} = \alpha + \beta_0 \left(R_{mt} - R_{ft}\right) + \gamma_0 \left(R_{mt} - R_{ft}\right)^2 + \gamma_1 \left(R_{mt} - R_{ft}\right)^3 + \varepsilon_{it}$$

In addition, Holmes and Faff (2004) also apply this cubic model to validate the result of the quadratic market-timing model. The positive and significant of $\gamma_1$ indicates that the quadratic model is misspecified. We add three factors to the Jagannathan and Korajczyk (1986) model and we define the equation as:

$$R_{it} - R_{ft} = \alpha + \beta_0 \left(R_{mt} - R_{ft}\right) + \gamma_0 \left(R_{mt} - R_{ft}\right)^2 + \gamma_1 \left(R_{mt} - R_{ft}\right)^3 + \beta_1 SMB + \beta_2 HML + \beta_3 MOM + \varepsilon_{it}$$

## RESULTS AND DISCUSSION

Table 1 presents the Carhart (1997) four-factor model results. Panel A displays the results for the full sample. With the significant positive $\alpha$ value, SRI funds in both regions outperform the market. North American SRI funds outperform the Eurekahedge SRI funds Index more so than their European

  

**Table 1**: Performance results of Carhart (1997) four-factor model

| *Panel A: All funds* | $\alpha$ | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ |
|---|---|---|---|---|---|
| North America | 0.1824*** | 0.9631*** | −0.1131*** | 0.1050*** | 0.0072** |
| Europe | 0.0632*** | 1.0520*** | 0.0435*** | −0.0590*** | −0.0289*** |

***significant at 1 per cent, **significant at 5 per cent and *significant at 10 per cent.

**Table 2**: Performance results based on screening type

| | $\alpha$ | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ |
|---|---|---|---|---|---|
| *Panel A: North America* | | | | | |
| Both positive and negative | 0.2117*** | 0.9344*** | −0.0585*** | 0.0782*** | 0.0068 |
| Negative | 0.0769*** | 0.9522*** | −0.2040*** | −0.1606*** | 0.0019 |
| Positive | 0.1905* | 1.0421*** | −0.0455 | 0.0514*** | 0.0078 |
| *Panel B: Europe* | | | | | |
| Both positive and negative | 0.0835*** | 1.0228*** | 0.0814*** | −0.0548*** | −0.0370*** |
| Negative | 0.1734*** | 1.3051*** | 0.1608*** | −0.1377*** | −0.0299*** |
| Positive | 0.0264 | 1.0513*** | 0.0050 | −0.0628*** | −0.0313*** |

***significant at 1 per cent, **significant at 5 per cent and *significant at 10 per cent.

counterparts. This result is consistent with Mallin *et al* (1995) and Otten and Bams (2002), who find that SRI funds in the United Kingdom outperform their conventional benchmark. However, this result contradicts some studies in the United States, for example, Gil-Bazo *et al* (2010) find no significant difference in performance between SRI funds and conventional funds.

Moreover, North American SRI funds are considered as conservative funds whereas the European SRI funds tend to be aggressive funds. We find a size effect in European SRI funds; however, the large sized portfolio contributes more to North American SRI funds. North American SRI funds exhibit a value effect whereas European SRI funds exhibit a growth effect. Lastly, a momentum effect is observed in North American SRI funds but a contrarian effect is seen in European SRI funds.

Table 2 reports the results according to screening type. All funds under the three screening criteria in both regions are found to outperform their respective market benchmark except for funds categorized under positive screening in Europe. In Europe all funds are aggressive while in North America, only SRI funds under the positive screening category are aggressive. The European SRI funds under both positive and negative, and negative categories exhibit the size effect only. All funds in Europe are found to possess the growth effect. Both positive and negative, and positive screening funds in North America exhibit the value effect. The European SRI funds for all screening types have a contrarian effect.

The performance results based on instrumental traded are shown in Table 3. SRI equity funds from both regions outperform their respective market benchmarks significantly and aggressive funds traded in cash,[5] fixed income, equity and fixed income[6] categories in North America underperform their benchmark. The size effect is present for balanced and equity funds in Europe. The growth effect is found in all categories except fixed income for European SRI funds. In North America, only funds traded in cash category have a growth effect. The momentum effect exists for equity SRI funds in North America while other SRI funds show contrarian effect which means the strategy of buying past losers contribute more return to the portfolio than buying past winners.

Table 4 illustrates the performance of funds that are based on fund size. Both small and large funds outperform the market

**Table 3**: Performance results based on instrumental traded

| | $\alpha$ | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ |
|---|---|---|---|---|---|
| *Panel A: North America* | | | | | |
| Balanced | 0.0571 | 0.6561*** | −0.0470*** | 0.0363*** | −0.0081** |
| Cash | −0.1975* | 0.0002 | −0.0160*** | −0.0126*** | −0.0106*** |
| Equity | 0.2141*** | 1.1521*** | −0.1550*** | 0.1314*** | 0.0107*** |
| Fixed Income | −0.1146* | 0.1543** | 0.0241 | 0.0345*** | −0.0156*** |
| Equities and Fixed income | −0.6458** | 1.1831*** | −0.1537** | −0.0552 | −0.0455** |
| *Panel B: Europe* | | | | | |
| Balanced | 0.0022 | 0.6794*** | 0.0342*** | −0.0405*** | −0.0302*** |
| Cash | 0.0356 | 0.2054 | 0.0171 | −0.0683* | −0.0479* |
| Equity | 0.0912*** | 1.4825*** | 0.0720*** | −0.0770*** | −0.0270*** |
| Fixed Income | −0.0111 | 0.0241** | −0.0193* | 0.0015 | −0.0244*** |
| Equities and Fixed Income | −0.0271 | 0.5884*** | −0.0454 | −0.0474* | −0.0298* |

***significant at 1 per cent, **significant at 5 per cent and *significant at 10 per cent.

**Table 4**: Performance result based on fund size

| | $\alpha$ | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ |
|---|---|---|---|---|---|
| *Panel A: North America* | | | | | |
| Small | 0.2320*** | 0.9826*** | −0.0468 | 0.0934*** | 0.0154** |
| Large | 0.2068*** | 0.9321*** | −0.1632*** | 0.1408*** | 0.0062 |
| *Panel B: Europe* | | | | | |
| Small | −0.0081 | 1.0655*** | 0.0850*** | −0.0463*** | −0.0212*** |
| Large | 0.1188*** | 1.0640*** | 0.0135 | −0.0689*** | −0.0361*** |

***significant at 1 per cent, **significant at 5 per cent and *significant at 10 per cent.

benchmark significantly in North America but for European SRI funds only large funds outperform their benchmark. North American SRI funds are conservative funds while European SRI funds are aggressive funds regardless of size. The size effect only exists in small sized funds in Europe. The value effect exists in North America while the growth effect exists in Europe regardless of size. Small funds in North America have a momentum effect but a contrarian effect exists in Europe for both small and large funds.

Table 5 presents the market-timing results using the Treynor-Mazuy (1966) model, the Three-Factor Treynor-Mazuy, the Four-Factor Treynor-Mazuy, the Henriksson-Merton (1981), the Three-Factor Henriksson-Merton and the Four-Factor Henriksson-Merton models. Panel A presents the results of market-timing models for North America while Panel B presents the results for Europe. Using the traditional Treynor-Mazuy (1966) and Henriksson-Merton (1981) models, both North American and European SRI fund managers possess market-timing skills in forecasting future market movement. This result contradicts the findings of Hayat and Kraeussl (2011), who find no market-timing skills for North American Islamic funds. Islamic funds is an ethical category and is one of the components of SRI funds. In addition, Schröder (2004) and Ferruz *et al*, 2012 also find no market-timing skill in the US SRI funds. However, this result is consistent with Renneboog *et al* (2008b), who find that market-timing skill exists in continental Europe.

Furthermore, European SRI fund managers are also good market-timers as shown by all the three- and four-factors models. However, North American SRI fund managers possess good market-timing skills only when we use the Henriksson-Merton models. This result is consistent

**Table 5**: Market-timing results

| | $\alpha$ | $\beta_0$ | $\gamma_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ |
|---|---|---|---|---|---|---|
| *Panel A: North America* | | | | | | |
| Treynor-Mazuy | 0.0716*** | 1.1869*** | 0.0081*** | — | — | — |
| Three-factor Treynor-Mazuy | 0.1240*** | 0.9546*** | −0.0025* | −0.1279*** | 0.0969*** | — |
| Four-factor Treynor-Mazuy | 0.1916*** | 0.9522*** | −0.0018 | −0.1172*** | 0.1069*** | 0.0065** |
| Henriksson-Merton | −0.1096*** | 1.0800*** | 0.2203*** | — | — | — |
| Three-factor Henriksson-Merton | 0.0334 | 0.9593*** | 0.0574*** | −0.1194*** | 0.0882*** | — |
| Four-factor Henriksson-Merton | 0.1121*** | 0.9455*** | 0.0766*** | −0.1054*** | 0.1014*** | 0.0088*** |
| *Panel B: Europe* | | | | | | |
| Treynor-Mazuy | −0.0348** | 0.9704*** | 0.0048*** | — | — | — |
| Three-factor Treynor-Mazuy | −0.0238 | 1.0954*** | 0.0083*** | 0.0835*** | −0.0303*** | — |
| Four-factor Treynor-Mazuy | 0.0007 | 1.0905*** | 0.0064*** | 0.0646*** | −0.0526*** | −0.0193*** |
| Henriksson-Merton | −0.0459* | 0.9351*** | 0.0510*** | — | — | — |
| Three-factor Henriksson-Merton | −0.0779*** | 1.0189*** | 0.1148*** | 0.0767*** | −0.0301*** | — |
| Four-factor Henriksson-Merton | −0.0200 | 1.0361*** | 0.0715*** | 0.0546*** | −0.0564*** | −0.0233*** |

***significant at 1 per cent, **significant at 5 per cent and *significant at 10 per cent.

**Table 6**: Cubic market-timing results

| | $\alpha$ | $\beta_0$ | $\gamma_0$ | $\gamma_1$ | $\beta_1$ | $\beta_2$ | $\beta_3$ |
|---|---|---|---|---|---|---|---|
| *Panel A:North America* | | | | | | | |
| Cubic Treynor-Mazuy | 0.0482** | 1.1672*** | 0.0123*** | 0.0006** | — | — | — |
| Cubic three-factor Treynor-Mazuy | 0.1268*** | 0.9559*** | −0.0030* | −0.0001 | −0.1279*** | 0.0976*** | — |
| Cubic four-factor Treynor-Mazuy | 0.1920*** | 0.9525*** | −0.0019 | 0.0000 | −0.1172*** | 0.1068*** | 0.0065** |
| *Panel B: Europe* | | | | | | | |
| Cubic Treynor-Mazuy | −0.0183 | 0.9841*** | 0.0018 | −0.0004** | — | — | — |
| Cubic three-factor Treynor-Mazuy | −0.0199 | 1.0968*** | 0.0075*** | −0.0001 | 0.0841*** | −0.0287*** | — |
| Cubic four-factor Treynor-Mazuy | 0.0151 | 1.0941*** | 0.0038** | −0.0003* | 0.0642*** | −0.0501*** | −0.0214 |

***significant at 1 per cent, **significant at 5 per cent and *significant at 10 per cent.

with Ang and Lean (2013b) who find that Luxembourg-based fund managers are good market-timers.

As a robustness check, Table 6 presents the results of robust market-timing models. The results are similar to those in Table 5 where there is evidence of market-timing in North America using the cubic Treynor-Mazuy model and in Europe using the cubic three- and four-factor Treynor-Mazuy models. The evidence of an insignificant $\gamma_1$ and significant negative $\gamma_1$ in Europe indicates that the quadratic term of excess return captures the return of SRI funds. This result is consistent with Bauer *et al* (2006) whereby quadratic models are not misspecified for New Zealand's mutual funds. However, the positive significant $\gamma_1$ in North America signifies that the quadratic model is unable to model market-timing and the market-timing skills have to be modeled by cubic model. However, $\gamma_1$ is insignificant when size, value and momentum factors are incorporated into the model. Thus, the quadratic model is still the best fitted model to examine the market-timing skills of fund managers.

## CONCLUSION

This article presents the results of the first comparative study on market-timing of SRI funds in North America and Europe using a

broad sample of 248 North American and 500 European SRI funds. We find that both North American and European SRI funds perform better than their market benchmark. SRI funds in North America outperform the market regardless of the screening type whereas in Europe, SRI funds that adopt both positive and negative, and negative screening outperform the market significantly. Moreover, only equity SRI funds outperform the Eurekahedge SRI funds Index in both regions. Lastly, SRI funds in North America outperform the market regardless of fund size, whereas only large European SRI funds outperform the market.

We find evidence of market-timing in both North America and Europe. Future research could venture into SRI funds in the Middle East North Africa region (MENA), using conditional models to evaluate performance as in Ferson and Schadt (1996) while shedding some light into this evolving part of the world.

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## NOTES

1. Conventional funds do not go through a stringent screening process during portfolio formation.
2. Religious funds are formed based on moral belief or religious teachings that normally exclude the so-called 'sin' stock during the screening process. For example, companies in the tobacco, alcohol and gambling industries.
3. Conservative funds indicate that the fund return's fluctuation is less than the market return (that is, the fund's $\beta$ is less than one).
4. The other category represents Austria, Belgium, British Virgin Island, Cayman Island, Denmark, Germany, Guernsey, Ireland, Isle of Man, Italy, Liechtenstein, Netherlands, Spain, Sweden and Switzerland.
5. Money market funds, certificates of deposit and other short-term obligations.
6. Not balanced fund, which invest in both equity and fixed income products.

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