The performance of US-based emerging market mutual funds

Halil Kiymaz and Koray D. Simsek
Rollins College – Crummer Graduate School of Business, Winter Park, Florida, USA

Received 20 July 2017
Revised 28 July 2017
Accepted 4 August 2017

Abstract

Purpose – The purpose of this paper is to examine the performance of US mutual funds that invest primarily in emerging market equities and bonds.

Design/methodology/approach – The study adopts the Morningstar classification of mutual funds and uses the Lipper US Mutual Fund Database through FactSet to obtain monthly returns and various metrics for emerging market equity and bond mutual funds covering the period from January 2000 to May 2017. Several descriptive statistics for these funds are reported as well as various risk-adjusted performance measures. Alphas are computed for different sub-periods using different factor models to mitigate potential biases.

Findings – The results show that diversified emerging market funds generate some significant alphas for their investors during the study period. Emerging market bond funds, on the other hand, do not provide any significant positive alphas; mostly alphas are negative. An analysis of sub-period performance suggests that these funds do not consistently provide excess returns, showing great variations from one period to another.

Originality/value – The emerging market funds provide US investors with an alternative source of exposure for their portfolios. Emerging markets differ from developed markets on a wide range of market and economic characteristics, including size, liquidity, and regulation. This study contributes to the scarce literature on these types of funds and provides a comprehensive performance assessment against various benchmarks during a period that encompasses significant bear and bull markets across the world.

Keywords Emerging markets, Performance evaluation, Mutual funds, Diversified funds, Bond funds

Paper type Research paper

1. Introduction

The growth of emerging market economies has been remarkable over the past 35 years. Their share of the global GDP had risen from 21 percent in 1980 to 36 percent by 2014 (International Monetary Fund, 2016, p. 63). Coupled with this pace, capital flows to emerging markets have boomed. During the 2000-2013 period, these markets received cumulative capital inflows of roughly $10 trillion (Plantier, 2015). About 20 percent of this amount is attributable to portfolio flows, defined as the purchases of emerging market stocks and bonds by non-residents of these countries. Plantier (2015) notes that emerging market stocks and bonds held by foreign investors increased from $1.5 trillion in 2005 to roughly $3.5 trillion by 2013, also reflecting the investment returns.

Because of increased interest in investing in emerging markets, investment companies have created various emerging market mutual funds to meet the needs of investors. The popularity of these investment funds comes from their ability to provide diversification benefits as well as their impressive return performance in the long term. Since operating and economic environment in emerging markets are different from those of developed markets,

JEL Classification — G11, G15, G23

The authors would like to thank the editor and two referees, whose comments helped improve the paper. All remaining errors are of the authors.

Journal of Capital Markets Studies
Vol. 1 No. 1, 2017
pp. 58-73
Emerald Publishing Limited
2514-4774
DOI 10.1108/JCMS-10-2017-003

investing in emerging markets can provide opportunities for fund managers to obtain excess returns or alpha. On the other hand, the volatility in these markets is higher so the additional risk should be included in the analysis.

The question of whether active fund managers can produce positive alphas has received attention from both practitioners and academicians. The proponents in manager's ability to generate positive alphas believe alphas represent disequilibrium returns that can exist in complex financial markets. For example, Jarrow (2010) argues that persistent and frequent arbitrage opportunities are much rarer, even in complex markets and therefore positive alphas are more fantasy than fact. Roll (1992) shows such portfolios are suboptimal and risky because they do not belong to the mean-variance frontier. Alexander and Baptista (2010) propose a method to lessen this sub-optimality that involves the objective of selecting a portfolio from the set of portfolios that have minimum tracking error variance. As persistent and frequent arbitrage opportunities are much rarer, even in complex markets, Jarrow (2010) argues that positive alphas are more fantasy than fact and unobservable factors can create false positive alphas.

This study provides an analysis of US-based diversified emerging market funds and emerging market bond funds during January 2000 and May 2017 period. Morningstar® labels mutual funds that primarily invest in emerging market equities as diversified emerging markets. Emerging markets bond mutual funds, on the other hand, predominantly invest in hard-currency-denominated bonds issued by entities in emerging market countries. These two categories of funds provide an alternative to US investors who want to expose their portfolios to these markets. They offer an inexpensive and convenient way of obtaining high returns from emerging markets while diversifying risk. The number of funds has increased sharply during the last two decades. For example, more than 80 percent of the mutual funds in our sample were established after 2000.

To assess the performance of the mutual funds, this study examines the fund managers' efforts for searching alphas in their portfolios. Erb *et al.* (1999, 2000) and Harvey (1995) argue that evaluating the performance of emerging capital markets is difficult as market conditions influence the return characteristics of the emerging market significantly. So, it is important to have a data set that would cover various market conditions. The period under study covers significant ups and downs in the financial markets. These include technology bubbles of the USA through 2003, one of the greatest expansions in US markets during 2003 and 2007, and finally global financial crisis of 2007-2009. The sample includes 222 diversified emerging market and 78 emerging market bond funds. The findings show that diversified emerging market fund managers experience limited success in their search for alphas during 2000 and 2017 while emerging market bond fund managers fail to realize positive alphas in general. Most funds do not provide statistically significant alphas.

To the best of our knowledge, this is the first study to comprehensively analyze the performance of both diversified and bond emerging market mutual funds in the USA. The remainder of the paper is organized as follows. A detailed review of the literature is given in the next section. Section 3 describes the data and details of the empirical methodology. Findings of the data analysis are presented and discussed in Section 4 and conclusions are provided in Section 5.

2. Literature review

Academic research on emerging markets has become very popular since various developing economy data sources became available in the mid-1990s. Kearney (2012) provides an overall review of this booming literature, while Atilgan *et al.* (2015) present a detailed review of the empirical studies on emerging equity markets.

Studies on performance of emerging market equity and bond funds report mixed results. Among earlier studies, Cumby and Glen (1990) examine the performance of a sample of

15 US-based, internationally diversified mutual funds for the 1982-1988 period. Findings suggest that these funds did not over-perform a broad international equity index over the sample period. There is, however, evidence the funds outperformed the US index. Eun *et al.* (1991) report similar results while analyzing 19 international mutual funds during the 1977-1986 period. The findings show that these funds have allowed US investors to diversify risk internationally. While most funds studied outperformed S&P 500 Index during the study period, they underperformed the MSCI World Index.

Chen and Jang (1994) examine the performance of 15 US-based international mutual funds for the 1980 and 1989 period to identify managers' selection and timing abilities. Findings show that most of the internationally diversified mutual funds outperformed the domestic stock market index in both selectivity and timing. On the other hand, when these funds were evaluated against World Market Index, there is little evidence of stock selection ability for those fund managers. Findings further show that most international fund managers have more macro-forecasting skills than micro-forecasting skills.

Droms and Walker (1994) find that alphas for international equity funds are not significantly different from 0. Also, they show that investment returns are not related to load status, asset size, expense ratios, and turnover rates. The analysis finds no reward for paying a load fee when investing in mutual funds.

Kao *et al.* (1998) examine the selectivity and market timing ability of international mutual fund managers using 97 funds during the 1989-1993 period. Findings show that international fund managers are poor market-timers. Managers of certain funds, including those of Pacific, Foreign, and World funds, have good selectivity performance. Further, there is a negative correlation between the selection and timing ability of international fund managers and managers of European funds show weaker performance than those managing other groups.

Lin (2006) examines the performances of Japanese broad-market equity managers. Findings show that these managers outperform index returns during the 1981-2004 period. The findings further suggest that these managers underweight large cap stocks and financials and take less market risk.

Gottesman and Morey (2007) examine the performances of diversified emerging market mutual funds by using 54, 83, and 74 funds for the years 1997, 2000, and 2002, respectively. They examine various fund characteristics including expense ratio, portfolio turnover, and manager tenure on fund performance. Findings show that only expense ratio influences the fund performance, lower expense ratio funds are associated with higher fund performance.

Latif and Kazemi (2007) use a stochastic model to examine US-based international mutual funds during the 1990-2003 period. Sample funds are classified based on regions (such as Europe, Pacific, and World). Results show that global equity markets are well integrated. Fund managers cannot consistently earn excess returns above a buy and hold strategy in US equity market.

Michelson *et al.* (2008) examine the benefits of investing in emerging markets mutual funds during the 1999-2005 period. The authors show the emerging market funds outperform the MSCI Index and the S&P 500 Index but underperform the emerging market index. They further report a negative relation between emerging market fund returns and turnover, and a positive relation between fund returns and size. Lin *et al.* (2009) argue that having a global view adds flexibility to asset allocation process as fund managers can shift their investments between US and non-US stocks. With skilled managers, a higher alpha can be achieved without adding more risk.

Huij and Post (2011) are the first to document performance persistence for emerging market equity funds by utilizing the approach pioneered by Carhart (1997). They also compare them to other US mutual funds and find that winner funds in emerging markets generate significant returns net of fees and contribute more to the winner-loser return differential. They find that momentum effects in emerging markets can explain only of this

return spread. Their findings suggest a general pattern of over-performance of emerging market equity funds as compared with US equity funds.

Basu and Huang-Jones (2015) also look at diversified emerging market equity funds from 2000 through 2010. They exclude bond funds but include those that are domiciled outside of the USA. With respect to alpha, their findings are similar to ours and show that most of these funds underperform their benchmarks. They detect performance persistence as in the study of Huij and Post (2011). However, they show that poor performers drive this. Finally, employing a non-linear model, they find no evidence of market timing ability among these funds.

In addition to these studies that investigate the emerging market equity funds, there are a few others exploring the performance of bond funds. Among these, Gallo *et al.* (1997) examine the monthly returns of 22 US-based international bond mutual funds from 1988 to 1994. They report these funds perform better than the Salomon Brothers Non-US Dollar World Government Bond Index. The excess returns measured with the multi-index models are similar to those measured with the single-index model. The authors find that portfolio consisting of all funds outperform the multi-index benchmark while five of the funds outperform the benchmark individually. When comparing the results of the two models, the authors find the multi-index model is better at explaining returns.

Polwitoon and Tawatnuntachai (2008) analyze the 50 emerging market bond funds during the 1996-2005 period and report that these funds outperform both domestic bonds and global bonds funds. Authors argue that these bonds provide international diversification benefits to both US and international bond and equity portfolios. The findings further show that exchange rate risk does not explain the differences in portfolio performance. Country-specific and liquidity risks explain a large portion of variation in performances of these funds.

Overall, the literature on the performances of international equity and bond funds reports mixed results with most studies outlining the benefit of international diversification benefits. This paper provides a comprehensive analysis of both emerging equity and bond fund performance.

3. Data and methodology

3.1 Data

Monthly returns from January 2000 through May 2017 for diversified emerging market funds and emerging market bond funds are obtained from the Lipper US Database on FactSet. The fund classifications are determined based on Morningstar categories with the same names. The initial diversified emerging market fund sample includes 787 funds. We remove funds with more than one share classes and those with fewer than 12 months of data[1]. The net sample of diversified emerging market funds consists of 222 funds. Applying a similar screening procedure to an initial sample of 304 emerging market bond funds resulted in a net sample of 78 bond funds. These steps are also presented in Table I.

	Diversified emerging market funds	% of total	Emerging markets bond funds	% of total	Total
Initial sample of funds	787	72	304	28	1,091
Less: multiple share classes	555	71	224	29	779
Less: fewer than 12 observations	10	83	2	17	12
Final sample	222	74	78	26	300

Notes: The table explains how filters are used to obtain the final sample consisting of 222 diversified emerging market funds and 78 emerging markets bond funds. Study period spans from January 2000 to May 2017

Table I. Sample selection

Table II outlines various fund characteristics and portfolio holdings of both diversified emerging market funds and emerging markets bond fund categories. It should be noted that the mean expense ratio for diversified emerging funds (1.22 percent) is higher compared to bond funds (0.86 percent). These values are lower than those in the study of Basu and Huang-Jones (2015), confirming a general trend toward lower cost funds in general. Average diversified equity funds ($1,759) have higher net assets under management (in millions) as compared with bond funds ($703). Given that holdings of non-residents in emerging bond and equity markets are roughly equal (Plantier, 2015), it appears that equity investors have a higher tendency to invest through mutual funds compared to bond investors. Other characteristics of interest include turnover, front load, management tenure, Morningstar overall star ratings, portfolio holdings, and various equity- and bond-specific holding characteristics.

Panel A in Table III provides the descriptive statistics for diversified emerging market funds. The average annualized geometric return for 222 funds during the study period is 4.87 percent, with the best-performing fund at 38.32 percent and worst performer at −4.68 percent. The panel further provides minimum, maximum, and quartiles distribution. The average standard deviation is 17.43 percent for this group. The data distribution is negatively skewed, indicating that the mean is less than the median. This means these funds tend to earn extreme negative returns. The data have positive kurtosis, suggesting a peaked distribution. This would show the portfolio's returns cluster closer to the mean value than they would if they were normally distributed and are also fatter tailed.

Panel B in Table III reports the descriptive statistics of emerging market bond funds. With respect to the annualized geometric returns, the average value for 78 bond funds is 5.64 percent yearly with the best- and worst-performing funds yielding 13.42 percent

	Diversified emerging equity funds			Emerging bond funds		
	Mean	Median	SD	Mean	Median	SD
Fund characteristics						
Turnover (%)	65.17	51.00	56.22	129.00	86.00	167.76
Expense ratio (%)	1.22	1.25	0.40	0.86	0.90	0.27
Front load (%)	0.31	0.00	1.27	0.28	0.00	1.04
Net assets ($ millions)	1,832.9	231.50	6,712.7	720.23	113.00	1,431.2
Manager tenure	4.56	4.00	3.07	4.70	4.00	4.32
Morningstar overall star rating	3.23	3.00	1.06	3.11	3.00	1.19
Portfolio holdings						
Equity holdings (%)	91.04	94.77	13.01	0.10	0.00	0.28
Bond holdings (%)	1.74	0.00	7.20	88.42	92.25	14.10
Cash holdings (%)	4.63	2.55	9.09	9.18	4.95	14.49
Other holdings (%)	2.59	1.87	2.53	2.30	1.72	2.61
Average holding characteristics						
Price/Earnings ratio	13.35	12.53	3.25			
Price/Book ratio	2.12	1.87	0.87			
Market capitalization ($ millions)	17,653	17,982	10,912			
Weighted coupon				6.40	6.42	1.05
Maturity				8.39	8.60	3.13
Duration				5.01	5.30	1.68

Table II. Summary fund characteristics and portfolio holdings

Notes: The table provides summary statistics (mean, median, and standard deviation) for various fund characteristics, portfolio holdings, and average holding characteristics specific to each type of funds. Study period spans from January 2000 to May 2017. These statistics are computed as of June 30, 2017, among funds with available data

	Annualized geometric mean return (%)	Annualized SD (%)	Average monthly return (%)	Highest monthly return (%)	Lowest monthly return (%)	Skewness	Kurtosis
Panel A: diversified emerging market funds (n = 222)							
Mean	4.87	17.43	0.52	13.68	−16.13	−0.20	1.21
Minimum	−4.68	6.36	−0.33	4.05	−32.94	−1.67	−1.31
Maximum	38.32	26.87	2.81	26.82	−1.20	0.89	6.80
First quartile (25%)	1.53	14.29	0.24	10.82	−26.65	−0.52	0.37
Median	4.17	16.70	0.49	13.05	−12.36	−0.23	1.02
Third quartile (75%)	6.94	21.50	0.74	17.11	−8.77	0.12	1.79
Panel B: emerging market bond funds (n = 78)							
Mean	5.64	7.68	0.48	5.61	−8.28	−0.80	3.28
Minimum	−3.91	1.92	−0.30	1.20	−25.26	−2.84	−1.05
Maximum	13.42	11.46	1.11	10.98	−0.57	0.72	21.10
First quartile (25%)	3.06	6.12	0.27	3.78	−9.77	−1.31	0.07
Median	5.70	7.83	0.48	5.12	−5.49	−0.55	0.59
Third quartile (75%)	7.58	9.46	0.66	7.45	−4.11	−0.27	4.49

Notes: The table provides descriptive statistics of monthly returns (unless specified otherwise in the table header) for diversified emerging market funds (Panel A) and emerging market bond funds (Panel B) during the sample period (January 2000-May 2017). The reported mean, minimum, maximum, quartiles, and median are across all funds in the same category

Table III. Descriptive statistics of emerging market mutual fund returns

and −3.91 percent returns, respectively. The average standard deviation is 7.68 percent. These bond fund returns are even more negatively skewed and leptokurtic compared to the diversified equity mutual funds, implying the presence of extreme losses and heavier tails.

In addition to the historical data on mutual funds, we obtain monthly changes on various total return indices from FactSet to use as benchmarks and to derive the emerging market counterparts for the research factors of Fama and French (1993) and Carhart (1997). Finally, as a proxy for the risk-free rate, we download one-month US Treasury Bill returns from the data library of Kenneth R. French (accessible at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

3.2 Methodology

As a preliminary step in evaluating emerging market mutual funds against their benchmarks, we compute several risk-adjusted performance measures. First, we calculate the Sharpe ratio as the funds' average excess return above the risk-free rate divided by the standard deviation of fund returns. More specifically, we use the standard formulation as follows:

$$\text{Sharpe ratio} = \frac{\overline{R}_i - \overline{R}_f}{\sigma_i} \tag{1}$$

where $\overline{R}_i$ is the annualized average return of the fund, $\overline{R}_f$ is the annualized risk-free rate (30-day US Treasury Bill rate), and σ_i is the annualized standard deviation of fund returns. As this calculation does not depend on a proxy for the market benchmark, it may be appropriate for examining the performance of emerging market funds. A higher Sharpe ratio implies outperformance of the fund on a risk-adjusted basis.

Next, we compute the Treynor ratio, which differs from the Sharpe ratio since it uses the beta of the fund with respect to its benchmark as the risk measure instead of the standard deviation of returns (Treynor and Black, 1973). Hence, excess return per unit of systematic

risk is measured by this ratio, which can be formulated as:

$$\text{Treynor ratio} = \frac{\overline{R}_i - \overline{R}_f}{\beta_i} \tag{2}$$

where β_i is the beta of the fund with respect to its benchmark.

Other risk-adjusted return measures we look at are the information ratio, Sortino ratio, and the M-squared. Information ratio is defined as the average annualized excess return of the fund above the benchmark divided by its tracking error. Tracking error, which is a statistical similarity measure, is computed as the annualized standard deviation of excess returns. A tracking error of 0 means that fund returns are identical to benchmark returns. Therefore, information ratio measures the performance of a fund as a multiple of its similarity with its benchmark. Sortino ratio focuses on the downside risk with respect to a minimum acceptable rate of return (MAR). In this paper, we assume that MAR is the annualized risk-free rate and therefore the numerator of this measure is identical to Sharpe and Treynor ratios. The denominator, on the other hand, is a semi-deviation type of measure where negative deviations from MAR are considered. Finally, M-squared is a transformed version of the unit-free Sharpe ratio. By multiplying the Sharpe ratio with the annualized benchmark return and adding the risk-free rate, one obtains this measure in units of percent.

In the main part of the empirical analysis, we estimate alphas of emerging market mutual funds using three different factor models. First, we run the capital asset pricing model (CAPM) to obtain the standard alpha in the spirit of Jensen (1968, 1969). This so-called Jensen's α is the difference between a fund's average rate of return and its expected position on the security market line given its market risk level. If a mutual has a positive (negative) Jensen's α, it then outperforms (underperforms) what the CAPM would predict. We run the following regression:

$$R_{it} - R_{ft} = \alpha_i + \beta_i \left(R_{mt} - R_{ft}\right) + \varepsilon_{it} \tag{3}$$

where R_{it} is the return on fund i in month t, R_{ft} is the one-month risk-free rate of return in month t, α_i is the Jensen's α of fund i, β_i is fund's systematic risk, and R_{mt} is the return on benchmark index in month t. As noted earlier, we use 30-day US Treasury Bill rates to proxy risk-free rate. Benchmark market index for diversified emerging market funds is chosen as Morgan Stanley Capital International Emerging Markets Investable Index (MSCI EM IMI). We similarly use Bloomberg Barclays Emerging Markets USD Aggregate as the benchmark index for emerging market bond funds. Jensen's α, the intercept of this regression, is a measure of the risk-adjusted incremental return obtained by the fund manager. A statistically significant positive (negative) alpha indicates superior (inferior) investment performance for each fund. The t-test is used to examine the statistical significance of these alphas.

Second, we apply the Fama-French three-factor model of Fama and French (1993) to estimate the fund alphas. This model accounts for the size and value factors and performs better than CAPM in most empirical studies:

$$R_{it} - R_{ft} = \alpha_i + \beta_i \left(R_{mt} - R_{ft}\right) + \delta_i SMB_t + \phi_i HML_t + \varepsilon_{it} \tag{4}$$

where SMB_t and HML_t are the size and value factors in month t. MSCI has a large cap and a small cap emerging market index that accounts for roughly 70 and 15 percent, respectively, of the market capitalization of these markets. MSCI EM Large Cap index returns are subtracted from MSCI EM Small Cap index returns to derive SMB factor returns. MSCI also splits the MSCI EM IMI Index as Growth and Value. We subtract the monthly returns of the Growth index from those of the Value index to generate the HML factor for emerging markets.

Finally, we estimate the Carhart (1997) four-factor model, which adds the momentum factor to the Fama-French three-factor model. This model adds one more term to the

regression equation:

$$R_{it}-R_{ft} = \alpha_i + \beta_i\left(R_{mt}-R_{ft}\right) + \delta_i SMB_t + \phi_i HML_t + \gamma_i MOM_t + \varepsilon_{it} \quad (5)$$

where MOM_t is the momentum factor in month t. We use the monthly changes in MSCI EM Momentum total return index as a proxy for this factor.

The market conditions influence the return characteristics and performance of emerging market securities dramatically, as pointed out by Erb *et al.* (1999, 2000). As a robustness check, we divide the entire period into four sub-periods, two involving recessions and significant bear markets, and the other two involving economic expansions and bull markets. We repeat the analyses above for these sub-periods and report our findings. It should also be noted that the analyses explained above are carried out for all funds individually as well as two equal-weighted portfolios, one representing each category of funds.

4. Empirical findings

4.1 Performance of diversified emerging market funds against benchmark indices

Panel A in Table IV reports risk-adjusted return measures for diversified emerging market funds. The mean Sharpe ratio, Jensen's α, and Treynor ratio are 0.21, 0.03, and 7.58, respectively. The Sharpe ratio ranges from 2.64 to −0.49 while Jensen's α has maximum and minimum values of 0.80 and −0.61, respectively. When we compare the performance of emerging market equity funds with various market indices, we find mixed results. Specifically, on average, these funds underperform S&P500 as well as both emerging market indices (MSCI and S&P/IFC) on a risk-adjusted basis. As their average Sharpe ratio (0.21) is lower compared to those of S&P500 (0.22), S&P/IFC (0.28), and MSCI Emerging Market (0.23). More than a quarter (56 out of 222) of these funds have better Sharpe ratios than these indices. Furthermore, the equal-weighted portfolio of these funds achieves a Sharpe ratio of 0.25, placing it only behind the S&P/IFC index.

Table V reports the sub-period analysis of diversified emerging market funds. In the extended US bear market period that runs from March 2000 to March 2003, the average Sharpe ratio for diversified emerging market funds is −0.83 while Sharpe ratios of S&P500, S&P/IFC, and MSCI Emerging Market indices are −0.90, −0.76, and −0.90, respectively. So, these funds seem to be providing US investors a better risk-adjusted performance and beating one of their benchmarks on average. Similar patterns are reported during the significant bear market of August 2007-February 2009, which is sometimes labeled as the Great Recession. Although we observe negative Sharpe ratio for funds as well as all benchmarks, it is better for the average fund as well as the equal-weighted portfolio of funds, compared to the S&P 500. Even though these funds fail to beat their emerging market benchmark indices on a risk-adjusted basis, they can provide US investors with better risk diversification.

During the first of the two expansion periods under consideration, emerging market equity funds outperform all the indices. Specifically, in the April 2003 and July 2007 period, the average Sharpe ratio for diversified emerging market funds was 2.66, while S&P500, MSCI EM IMI, and S&P/IFC have Sharpe ratios of 1.47, 2.51, and 2.62, respectively. We see mixed but mostly negative results during the March 2009-May 2017 period, which is the ongoing long US bull market period. During this era of unusually low volatility, S&P 500 posts a Sharpe ratio of 1.39 and emerging market funds or indices cannot quite match this performance. For example, Sharpe ratio for the diversified emerging market group is 0.17 compared to those of S&P500 (0.20), MSCI EM (0.44), and S&P/IFC (0.28). Only 7 out of 222 funds in our sample can outperform S&P 500 on a risk-adjusted basis.

Panel A: diversified emerging market funds (n = 222)

	Sharpe ratio	Treynor ratio (%)	Jensen's α (%)	Information ratio	Sortino ratio	M-squared
Mean	0.09	0.60	0.06	−0.02	0.15	8.02
Minimum	−0.32	−1.23	−0.86	−3.08	−0.37	−13.28
Maximum	0.56	4.20	1.77	1.84	1.01	39.20
First quartile (25%)	0.05	0.27	−0.13	−0.36	0.07	3.50
Median	0.09	0.61	−0.02	−0.05	0.16	8.58
Third quartile (75%)	0.13	0.84	0.14	0.22	0.21	11.97

Panel B: emerging market bond funds (n = 78)

	Sharpe ratio	Treynor ratio (%)	Jensen's α (%)	Information ratio	Sortino ratio	M-squared
Mean	0.13	0.48	−0.11	−0.18	0.22	4.92
Minimum	−0.26	−0.85	−0.90	−2.04	−0.31	−9.35
Maximum	0.59	7.50	0.66	1.39	1.22	20.74
First quartile (25%)	0.04	0.11	−0.36	−0.58	0.06	1.30
Median	0.13	0.45	−0.06	−0.19	0.20	5.08
Third quartile (75%)	0.22	0.67	0.08	0.20	0.37	9.29

Panel C: performance of benchmark indices

	Geometric mean (%)	SD (%)	Sharpe ratio	Sortino ratio
MSCI Emerging Markets Investable	6.65	22.24	0.23	0.76
S&P/IFC Investable Composite	7.89	22.24	0.28	0.95
S&P 500	4.90	14.73	0.22	0.81
Bloomberg Barclays Emerging Markets USD Aggregate bond	9.13	9.22	0.82	1.61
Bloomberg Barclays US Aggregate bond	5.22	3.45	1.05	4.39

Table IV. Risk-adjusted performance of mutual funds and their benchmarks

Notes: The table reports risk-adjusted performance measures computed for diversified emerging market funds (Panel A), emerging market bond funds (Panel B) during the sample period (January 2000-May 2017). The reported mean, minimum, maximum, quartiles, and median are across all funds in the same category. Panel C displays various performance measures for five benchmark indices

In sum, diversified emerging market funds appear to present a robust risk-adjusted performance for US investors except for the recent extended US bull market. Even though they have mixed results against their own benchmark indices, these funds outperform S&P 500 during our study period, both on average and as a portfolio.

4.2 Performance of emerging market bond funds against benchmark indices

Panel B in Table IV reports risk-adjusted performance of emerging market bond funds. The average Jensen's α has a value of −0.13 percent, suggesting most funds failed to provide positive alpha for their investors during the study period. The equal-weighted portfolio, on the other hand, has a Jensen's α of 0.03, although this is statistically insignificant. The average Sharpe ratio is 0.56 with a minimum value of −0.65 and a maximum value of 3.07. The emerging market bond funds underperformed both emerging and US bond indices as the Sharpe ratios for Bloomberg Barclays EM USD Aggregate and US Aggregate bond indices are 0.82 and 1.05, respectively. Only 5 of these 78 funds can outperform both indices on a risk-adjusted basis. The equal-weighted portfolio of emerging market bond funds has a Sharpe ratio of 0.82, matching the benchmark but still below the US Aggregate bond index. For the most part, these results are in contrast with the emerging market equity funds in Panel A, which are more likely to outperform their developed market benchmark. It appears that the emerging market bond funds are falling short of their diversification potential for investors in these markets.

	Annualized return (%)	Sharpe ratio	Treynor ratio (%)	Jensen's α (%)	Information ratio
Panel A: March 2000-March 2003 (n = 39)					
Mean	−14.41	−0.83	−20.38	0.04	0.42
Minimum	−23.41	−1.65	−54.26	−1.28	−1.01
Maximum	−2.14	−0.26	−6.50	0.78	2.55
Equal-weighted portfolio	−14.61	−0.87	−20.13	0.05	0.71
MSCI EM IMI	−17.18	−0.90			
S&P/IFC Investable	−14.19	−0.76			
S&P 500	−13.10	−0.90			
Panel B: April 2003-July 2007 (n = 57)					
Mean	40.55	2.66	42.49	0.10	−0.50
Minimum	17.99	1.49	22.78	−0.52	−6.46
Maximum	63.43	7.15	117.03	1.49	3.79
Equal-weighted portfolio	41.16	2.50	40.08	0.04	−0.51
MSCI EM IMI	42.49	2.51			
S&P/IFC Investable	44.36	2.62			
S&P 500	15.32	1.47			
Panel C: August 2007-February 2009 (n = 70)					
Mean	−42.21	−1.33	−47.75	−0.46	−0.51
Minimum	−73.05	−2.57	−97.07	−3.31	−7.03
Maximum	−29.06	−1.03	−37.39	0.46	1.01
Equal-weighted portfolio	−40.16	−1.28	−44.72	−0.41	−0.30
MSCI EM IMI	−38.96	−1.18			
S&P/IFC Investable	−38.84	−1.18			
S&P 500	−33.46	−1.79			
Panel D: March 2009-May 2017 (n = 222)					
Mean	7.09	0.42	12.44	0.04	−0.98
Minimum	−4.68	−0.37	−6.73	−0.55	−4.90
Maximum	38.32	2.81	986.58	0.80	11.71
Equal-weighted portfolio	12.06	0.63	12.85	0.05	−0.04
MSCI EM IMI	12.17	0.60			
S&P/IFC Investable	12.64	0.63			
S&P 500	17.98	1.39			

Notes: The table provides various performance measures computed for diversified emerging market funds during four distinct sub-periods. The mean, minimum, and maximum are calculated across all funds in this category. Statistics for three benchmarks as well as an equal-weighted portfolio of these funds are also reported for each sub-period

Table V.
Diversified emerging market funds: sub-period analysis

Table VI presents a sub-period analysis of emerging market bond fund performance. Average Jensen's α of individual funds is positive in first two of the four sub-periods under consideration, ranging from 0.10 to 0.33. Worst performance comes during the Great Recession period of 2007-2009 with −0.36. We also provide the average Sharpe ratios for sample funds as well as benchmark indices for each sub-period. Sharpe ratio for diversified emerging market funds during the first sub-period (March 2000 to March 2003) is 0.90 while Sharpe ratios of Bloomberg Barclays EM USD Aggregate and US Aggregate bond indices are 0.57 and 1.94 during the same period. This is a very interesting sub-period as all 12 funds outperform the emerging market benchmark but underperform the US benchmark under consideration. During the second sub-period in which US interest rates have consistently increased, we see a different pattern as emerging bond funds outperform both EM and US bond indices on average and on an equal-weighted portfolio basis. The story reverses during the Great Recession (August 2007-February 2009), the emerging market

	Annualized return (%)	Sharpe ratio	Treynor ratio (%)	Jensen's α (%)	Information ratio
Panel A: March 2000-March 2003 (n = 12)					
Mean	14.01	0.90	10.50	0.33	0.99
Minimum	10.64	0.62	7.35	0.10	0.17
Maximum	20.30	1.38	16.88	0.80	2.30
Equal-weighted portfolio	14.02	0.92	10.35	0.33	1.27
Bloomberg Barclays Emerging Markets USD Aggregate	9.61	0.57			
Bloomberg Barclays US Aggregate	10.00	1.94			
Panel B: April 2003-July 2007 (n = 16)					
Mean	12.51	1.41	9.52	0.10	0.21
Minimum	1.81	−0.23	−1.00	−0.09	−6.47
Maximum	18.25	3.07	19.72	0.51	3.45
Equal-weighted portfolio	13.76	1.48	10.03	0.07	1.57
Bloomberg Barclays Emerging Markets USD Aggregate	12.04	1.36			
Bloomberg Barclays US Aggregate	3.60	0.19			
Panel C: August 2007-February 2009 (n = 19)					
Mean	−10.16	−0.65	−13.07	−0.36	−0.91
Minimum	−20.32	−1.06	−24.78	−1.27	−1.95
Maximum	−4.37	−0.39	−7.46	0.05	0.55
Equal-weighted portfolio	−9.78	−0.66	−12.55	−0.37	−1.45
Bloomberg Barclays Emerging Markets USD Aggregate	−6.20	−0.44			
Bloomberg Barclays US Aggregate	5.70	0.71			
Panel D: March 2009-May 2017 (n = 78)					
Mean	5.99	0.87	5.47	−0.17	−1.55
Minimum	−3.91	−0.47	−3.10	−0.77	−6.65
Maximum	15.95	3.64	25.98	0.50	1.47
Equal-weighted portfolio	9.80	1.25	8.33	−0.16	−0.25
Bloomberg Barclays Emerging Markets USD Aggregate	10.25	1.55			
Bloomberg Barclays US Aggregate	4.25	1.46			

Table VI. Emerging markets bond funds: sub-period analysis

Notes: The table provides various performance measures computed for emerging markets bond funds during four distinct sub-periods. The mean, minimum, and maximum are calculated across all funds in this category. Statistics for two benchmarks as well as an equal-weighted portfolio of these funds are also reported for each sub-period

bond funds underperform both benchmark indices. While the equal-weighted portfolio of emerging market bond funds experiences a Sharpe ratio of −0.66, Bloomberg Barclays EM USD Aggregate and US Aggregate bond indices had Sharpe ratios of −0.44 and 0.71, respectively. During this period of global quantitative easing, it appears that emerging bond funds could not manage to earn positive dollar returns due to unfavorable exchange rate movements. Finally, during the last sub-period, the emerging market bond funds continued to underperform both indices although this was a much better period for the emerging market bond index.

Overall, we note mixed results in emerging market bond fund performance. As with the emerging market equity funds, these funds cannot consistently beat their benchmarks. On the other hand, their dismal performance compared to the US bond index will deter the investors in these markets to utilize these funds for bond investing in emerging markets.

4.3 Performance assessment of emerging market mutual funds with factor models

As explained in Section 3, we measure alphas using three different factor models: CAPM, Fama-French, and Carhart. We first estimate time-series regressions in Equations (3)-(5) for all individual funds in our sample and tabulate the results in Table VII. In Panel A, 118 of 222 diversified emerging market funds (53 percent) have positive CAPM alphas, but only 11 of them are statistically significant (5 percent). In total, 47 percent of these funds experience negative alpha (only 3 percent being statistically significant). On the other hand, the majority of emerging market bond funds do not provide positive alphas. For example, only 21 of 78 funds have positive alpha, and 5 of these are statistically significant at 5 percent level. Most bond funds have negative alphas (57 of 78 funds), and about 29 percent are statistically significant. Overall, the findings show that fund managers' search for alpha in emerging markets is not successful. Only 5 percent of diversified emerging market funds can provide statistically significant positive excess returns to investors. The findings for bond funds are slightly better as 6 percent of funds experience statistically significant alphas for their investors.

As the number of factors increase (going from CAPM to Fama-French to Carhart), an interesting pattern emerges. While the percentage of funds with positive (and statistically significant) alphas in the diversified emerging market category decreases, the same figure increases for the emerging market bond funds. This pattern can also be detected by looking at the histograms of factor model alphas in Figure 1. The charts on the left correspond to the diversified emerging market funds, and the distribution becomes more skewed to the left from top to bottom (i.e. as the number of factors in the model increases). Since the factors are effectively derived from emerging market equity index returns, it is not surprising to see that additional factors can drive away the alphas, the excess return unexplained by the factors. The charts on the right that correspond to the bond funds become more symmetric (or less skewed to the left) by the addition of multiple factors. In both cases, average adjusted R^2 values (not reported here) increase by approximately 0.03, implying that

Number of funds with	Diversified emerging market funds ($n = 222$)	Emerging market bond funds ($n = 78$)	Total ($n = 300$)
Panel A: CAPM			
Positive alpha	118 (53.2%)	21 (26.9%)	139 (46.3%)
Positive and significant alpha	11 (5.0%)	5 (6.4%)	16 (5.3%)
Negative alpha	104 (46.8%)	57 (73.1%)	161 (53.7%)
Negative and significant alpha	6 (2.7%)	23 (29.5%)	29 (9.7%)
Average adjusted R^2	0.8764	0.8354	
Panel B: Fama-French model			
Positive alpha	110 (49.5%)	24 (30.8%)	134 (44.7%)
Positive and significant alpha	8 (3.6%)	3 (3.8%)	11 (3.7%)
Negative alpha	112 (50.5%)	54 (69.2%)	166 (55.3%)
Negative and significant alpha	9 (4.1%)	18 (23.1%)	27 (9.0%)
Average adjusted R^2	0.9009	0.8487	
Panel C: Carhart model			
Positive alpha	100 (45.0%)	28 (35.9%)	128 (42.7%)
Positive and significant alpha	7 (3.2%)	6 (7.7%)	13 (4.3%)
Negative alpha	122 (55.0%)	50 (64.1%)	172 (57.3%)
Negative and significant alpha	11 (5.0%)	15 (19.2%)	26 (8.7%)
Average adjusted R^2	0.9060	0.8661	

Notes: The table presents the number of individual funds with alphas that are positive, negative, and statistically significantly positive or negative at 5 percent level. Panels A, B, and C report alphas based on CAPM, Fama-French three-factor model, and Carhart four-factor model, respectively. Percentages out of column total are given in parentheses

Table VII. Alphas for individual emerging market mutual funds

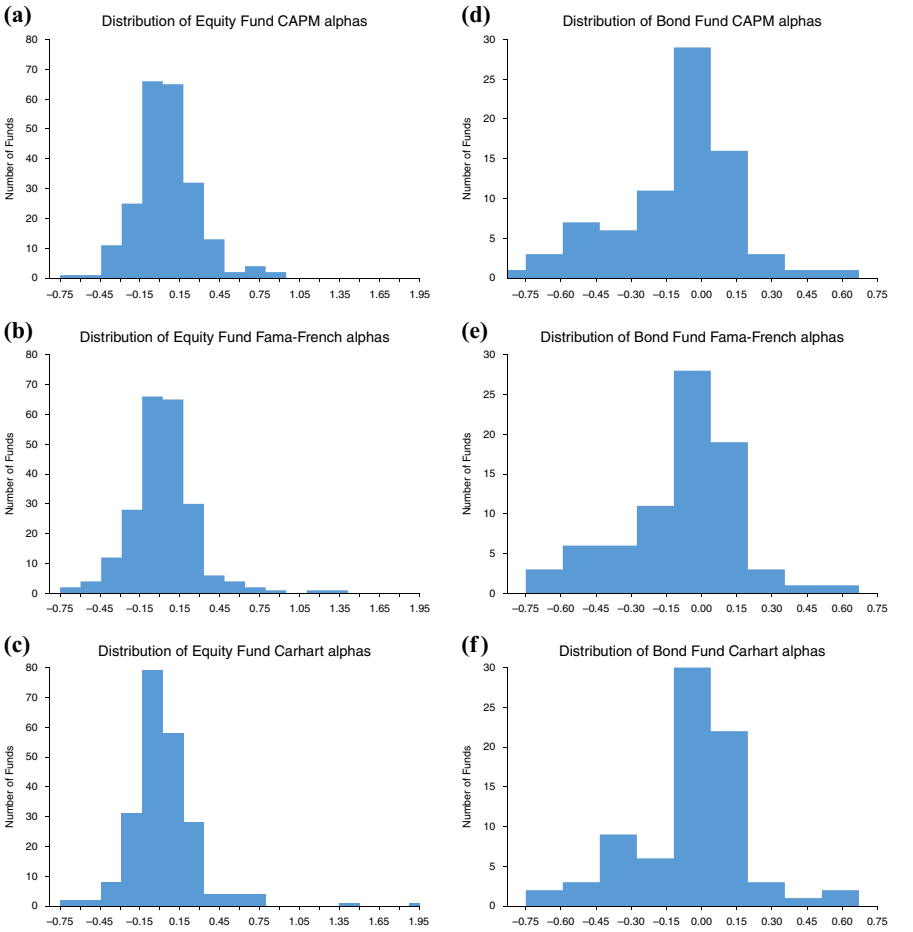

Figure 1.
Distribution of alphas for individual emerging market mutual funds

Notes: The left half of this figure displays the histograms of estimated alphas for individual diversified emerging market funds using the capital asset pricing model (a), Fama-French three-factor model (b), and Carhart four-factor model (c). The right half of this figure displays the histograms of estimated alphas for individual emerging market bond funds using the capital asset pricing model (d), Fama-French three-factor model (e), and Carhart four-factor model (f)

Carhart model works slightly better than CAPM in explaining monthly variation in emerging market mutual fund returns.

Our final analysis is devoted to the performance of the equal-weighted portfolios constructed within the two categories of emerging market mutual funds. Table VIII reports that alphas are insignificant for both portfolios under each of the three models. CAPM works so well for the diversified emerging market portfolio that adjusted R^2 barely changes by adding multiple factors. Still, the momentum factor is statistically significant, effectively reducing market beta. For the bond portfolio, CAPM works remarkably well, although with a slightly lower adjusted R^2 compared to the other portfolio. What is different is the weak significance of the size factor, which is further weakened by the addition of the momentum factor. In any case, the economic significance of these equity-based factors should be taken with a grain of salt.

	CAPM	Fama-French model	Carhart model
Panel A: diversified emerging market fund portfolio			
α	0.0257	0.0356	0.0305
β	1.0429***	1.0429***	0.9620***
δ		−0.0411**	−0.0337*
θ		−0.0188	0.0093
γ			0.0526***
Adjusted R^2	0.9499	0.9512	0.9603
Panel B: emerging market bond fund portfolio			
α	0.0327	0.1089	0.0067
β	0.9353***	1.0009***	0.8298***
δ		0.0650	−0.0144
θ		0.0369	−0.0267
γ			0.1063***
Adjusted R^2	0.9814	0.9817	0.9831

Notes: The table reports the factor model regression estimates for an equal-weighted portfolio of 222 diversified emerging market funds in Panel A and an equal-weighted portfolio of 78 emerging market bond funds in Panel B using monthly returns during January 2000-May 2017. *,**,***Significant at 10, 5, and 1 percent levels, respectively

Table VIII. Regression estimates for emerging market mutual fund portfolios

Overall, apart from a handful minority within both categories, these emerging market mutual funds resemble index funds with a tiny momentum factor tilt. It appears to be a difficult task to justify the fee structure, although the expense ratios have been shrinking over the past decade.

5. Conclusions

This study provides an analysis of US-based diversified emerging market equity and bond funds during January 2000 and May 2017. We examine the fund managers' efforts for searching alphas in their portfolios. The emerging market funds provide US investors with an alternative factor to expose their portfolios. These markets differ from developed markets on a wide range of market and economic characteristics, including size, liquidity, and regulation. The sample includes 222 diversified emerging market and 78 emerging market bond funds. The findings show that the diversified fund managers achieve limited success in their search for alphas during 2000 and 2017 while emerging market bond fund managers fail to realize positive alphas in general. Most funds do not provide statistically significant alphas. While 5 percent of diversified equity funds provide statistically significant alphas to their investors, about 6 percent of emerging market bond funds provide statistically significant positive alphas.

The study further provides evidence on the sub-period performance of these funds. These sub-periods cover significant ups and downs in the financial markets, including technology bubble of the USA, two of the greatest expansions in US markets during 2003-2007 and 2009-present, and finally financial crises of 2007 and 2009. The sub-period results suggest that while diversified emerging market funds experience negative returns during two of the four sub-periods, bond funds experience significant negative returns during the 2007-2009 period. The study concludes that emerging market fund managers are unable to provide positive alphas to their clients on a consistent basis.

These findings have important implications for investors. It appears that investors in developed markets such as the USA can benefit significantly from including the diversified emerging market funds in their portfolios. Unless there is an extended bull market such as the one that has been continuing through 2017, these funds can generate higher risk-adjusted returns compared to the developed market benchmark. On the other hand,

these funds do not appear to be generating alphas above the emerging market risk factors under consideration. This implies that investors can realize the same risk-adjusted performance by investing in emerging market index funds or ETFs. These results are less valid for emerging market bond funds as they seem to have difficulty matching the risk-adjusted performance of developed market bond benchmarks. Investors are most likely aware of this situation. As Plantier (2015) reports, foreign investors allocate equally between emerging market equities and bonds. However, they are approximately half as likely to prefer regulated funds (such as mutual funds) to access the bond markets.

Note

1. We only include funds with at least 12 months of returns during the study period. As with most mutual fund studies, the mutual fund return data are subject to survivorship bias. Elton *et al.* (2001) show that survivorship bias of Morningstar is minimal. Grinblatt and Titman (1989) also conclude that the survivorship bias is negligible for a sample that includes surviving and non-surviving funds in their study.

References

Alexander, G. and Baptista, A. (2010), "Active portfolio management with benchmarking: a frontier based on alpha", *Journal of Banking and Finance*, Vol. 34 No. 9, pp. 2185-2205.

Atilgan, Y., Demirtas, K.O. and Simsek, K.D. (2015), "Studies of equity returns in emerging markets: a literature review", *Emerging Markets Finance and Trade*, Vol. 51 No. 4, pp. 757-773.

Basu, A.K. and Huang-Jones, J. (2015), "The performance of diversified emerging market equity funds", *Journal of International Financial Markets, Institutions & Money*, Vol. 35 No. C, pp. 116-131.

Carhart, M. (1997), "On persistence in mutual fund performance", *Journal of Finance*, Vol. 52 No. 1, pp. 57-82.

Chen, S. and Jang, H. (1994), "On selectivity and market timing ability of US-based international mutual funds: using refined Jensen's measure", *Global Finance Journal*, Vol. 5 No. 1, pp. 1-15.

Cumby, R.E. and Glen, J.D. (1990), "Evaluating the performance of international mutual funds", *Journal of Finance*, Vol. 45 No. 2, pp. 497-521.

Droms, W.G. and Walker, D.A. (1994), "Investment performance of international mutual funds", *Journal of Financial Research*, Vol. 17 No. 1, pp. 1-14.

Elton, E.J., Gruber, M.J. and Blake, C.R. (2001), "A first look at the accuracy of the CRSP mutual fund database and a comparison of the CRSP and Morningstar mutual fund databases", *Journal of Finance*, Vol. 56 No. 6, pp. 2415-2430.

Erb, C.B., Harvey, C.R. and Viskanta, T.E. (1999), "New perspectives on emerging market bonds", *Journal of Portfolio Management*, Vol. 25 No. 2, pp. 83-92.

Erb, C.B., Harvey, C.R. and Viskanta, T.E. (2000), "Understanding emerging market bonds", *Emerging Markets Quarterly*, Vol. 4 No. 1, pp. 17-23.

Eun, C., Kolodny, R. and Resnick, B.G. (1991), "US-based international mutual funds: a performance evaluation", *Journal of Portfolio Management*, Vol. 17 No. 3, pp. 88-94.

Fama, E.F. and French, K.R. (1993), "Common risk factor in the return on stocks and bonds", *Journal of Financial Economics*, Vol. 33 No. 1, pp. 3-56.

Gallo, J.G., Lockwood, L.J. and Swanson, P.E. (1997), "The performance of international bond funds", *International Review of Economics and Finance*, Vol. 6 No. 1, pp. 17-35.

Gottesman, A.A. and Morey, M.R. (2007), "Predicting emerging market mutual fund performance", *Journal of Investing*, Vol. 16 No. 3, pp. 111-122.

Grinblatt, M. and Titman, S. (1989), "Mutual fund performance: an analysis of quarterly portfolio holdings", *Journal of Business*, Vol. 62 No. 3, pp. 393-416.

Harvey, C.R. (1995), "Predictable risk and returns in emerging markets", *Review of Financial Studies*, Vol. 8 No. 3, pp. 773-816.

Huij, J. and Post, T. (2011), "On the performance of emerging market equity mutual funds", *Emerging Markets Review*, Vol. 12 No. 3, pp. 238-249.

International Monetary Fund (2016), *World Economic Outlook: Too Slow for Too Long*, Washington, DC, April.

Jarrow, R.A. (2010), "Active portfolio management and positive alphas: fact or fantasy?", *Journal of Portfolio Management*, Vol. 36 No. 4, pp. 17-24.

Jensen, M.C. (1968), "The performance of mutual funds in the period 1945-1964", *Journal of Finance*, Vol. 23 No. 2, pp. 389-416.

Jensen, M.C. (1969), "Risk, the pricing of capital assets, and the evaluation of investment portfolios", *Journal of Business*, Vol. 42 No. 2, pp. 167-247.

Kao, W.G., Cheng, L.T.W. and Chan, K.C. (1998), "International mutual fund selectivity and market timing during up and down market conditions", *Financial Review*, Vol. 33 No. 2, pp. 127-144.

Kearney, C. (2012), "Emerging markets research: trends, issues and future directions", *Emerging Markets Review*, Vol. 13 No. 2, pp. 159-183.

Latif, S. and Kazemi, H. (2007), "International financial integration and the performance of international mutual funds", *International Journal of Finance*, Vol. 19 No. 4, pp. 4514-4532.

Lin, W. (2006), "Performance of institutional Japanese equity fund managers", *Journal of Portfolio Management*, Vol. 32 No. 4, pp. 117-127.

Lin, W., Hoffman, P. and Duncan, A. (2009), "Investing in global equities: an alternative approach to structuring equity portfolios", *Journal of Portfolio Management*, Vol. 35 No. 2, pp. 50-60.

Michelson, S., Philipova, E. and Srotova, P. (2008), "The case for emerging market funds", *Journal of Business and Economics Research*, Vol. 6 No. 11, pp. 81-88.

Plantier, L.C. (2015), "Regulated funds, emerging markets, and financial stability", *ICI Global Research Perspective*, Vol. 2 No. 1, pp. 1-40, available at: www.iciglobal.org/pdf/icig_per02-01.pdf

Polwitoon, S. and Tawatnuntachai, O. (2008), "Emerging market bond funds: a comprehensive analysis", *Financial Review*, Vol. 43 No. 1, pp. 51-84.

Roll, R. (1992), "A mean/variance analysis of tracking error", *Journal of Portfolio Management*, Vol. 18 No. 4, pp. 13-22.

Treynor, J.L. and Black, F. (1973), "How to use security analysis to improve portfolio selection", *Journal of Business*, Vol. 46 No. 1, pp. 66-86.

Corresponding author
Koray D. Simsek can be contacted at: ksimsek@rollins.edu