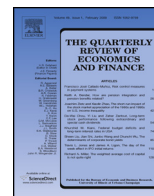# ARTICLE IN PRESS

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Diversification of risk exposure through country mutual funds under alternative investment opportunities

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A B S T R A C T

This paper examines the behavior of time variation in the risk exposure of country mutual funds to the movements of the US and benchmark foreign markets. It uses weekly data on 15 closed end funds and 19 exchange traded funds for the sample period between January, 2001 and December, 2012. Conditional factor models are employed to uncover the time variation in the estimated betas through short window regressions. The findings of the paper indicate considerable time variation in risk exposure of country mutual funds to the US market and foreign market risk factors. The US market betas exhibit greater variation over the sample period than the target foreign market betas. The overall fluctuation in betas for the closed end funds is found to be higher than that for the exchange traded funds, and emerging market funds experience more oscillation in the risk exposure than their developed market counterparts. We also find that a combination of the US macroeconomic state variables and investors' sentiment significantly predicts future betas.

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1. Introduction

The tradeoff between risks and returns plays an important role in making investment decisions. Investors attempt to reduce the risk of their portfolio by diversifying their asset holdings so that they are sufficiently unrelated to each other. Also, it is possible that investors would allocate a substantial portion of their funds toward foreign assets instead of domestic assets in order to seek higher returns. Bekaert, Hoyem, Hu, and Ravina (2015) present evidence from a large number of retirement funds that US investors have allocated as high as 75% of their portfolio in funds that are based on international equities. Curcuru, Thomas, Warnock, and Wongswan (2014) show that tactical reallocations of US investors are due more to an appetite for higher returns than reducing risks.

A number of studies have investigated whether country mutual funds such as closed end funds (CEFs) and exchange traded funds (ETFs) offer diversification opportunities for investors.[1] Country mutual funds are traded on the US stock exchanges and are designed to track the performances of a broad international market index. While they may replicate the performance of foreign equity markets, their listing on US markets exposes them to domestic risk such as the US market movements. The central question being asked here is how the international diversification opportunities facing US investors fluctuate while the underlying state of the economy changes over time. For example, Coeurdacier and Guibaud (2011) report that investors actively rebalance their portfolio in favor of countries that offer superior diversification potential. An important vacuum in the existing literature is the absence of studies that account for time variation in the risk exposure of country mutual funds to their underlying foreign assets, and to the US market, where these funds are listed. The literature examining the diversification potential of country mutual funds does not in general consider time variation in estimated betas. However, risk exposures of country mutual funds to either domestic or foreign markets would not theoretically remain constant over time.[2]

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[1] Refer to Errunza et al. (1999), Zhong and Yang (2005), Phengpis and Swanson (2009) and Huang and Lin (2011), Levy and Lieberman (2013), Noman (2015), among others.

[2] For example, time varying integration among international markets has been documented in Pukhuanthong and Roll (2009), Baele and Inghelbrecht (2009), and Turtle and Zhang (2012).

In this paper, we examine the magnitudes of risk exposure of country mutual funds, namely CEFs and ETFs, to their underlying assets and to the US market, as measured by beta coefficients in a multifactor model, and their effects on diversification opportunities for US investors. The US market beta can be thought of a measure of local market risk for the country mutual funds. As such, significance of US market betas would indicate that the local market risk is priced in the funds' risk–return relationship. Similarly, a significant foreign market beta is indication of the fact that foreign market risk is priced. We employ conditional two factor models for each fund and compare whether time varying risk exposure behaves differently between CEFs and ETFs as well as between developed and emerging markets. Furthermore, we examine whether the conditional betas can be predicted by a set of macro state variables in panel data settings. Beta, as a measure of the risk exposure of a financial asset to the overall market, has been shown to vary with overall conditions of an economy and fundamentals of the asset itself. Lewellen and Nagel (2006) find that a set of macroeconomic variables has predictive power for estimated conditional betas of size, value and momentum portfolios in the US economy. The short window regressions used in this paper allow us to capture alternative investment opportunities for US investors seeking diversification benefits without explicitly specifying any instrumental variables.

Although both CEFs and ETFs are traded on organized exchanges, there are a number of differences between them. ETFs offer intraday trading while CEFs do not, and hence, their responses to changes in risk factors may also be different. ETFs are considered to be able to replicate the performance of their underlying benchmark index more closely than CEFs. Pennathur, Delcoure, and Anderson (2002) examine whether CEFs provide cross-border diversification opportunities for US investors using two factor models and find the presence of limited diversification benefits. They suggest foreign direct investment (FDI) as the alternative toward obtaining diversification. But the FDI option may not be so readily available to many investors. Huang and Lin (2011) show that indirect portfolio investments through country ETFs are more effective than FDI for the purpose of diversification, and their relative efficiency in terms of performance measures. Zhong and Yang (2005) report that iShares country ETF returns are more closely related to the US market than overseas markets, and hence, limitations of iShares as a method of achieving diversification benefits.[3] Contrary to their findings, Phengpis and Swanson (2009) show that country ETFs are exposed to the movements of their underlying country indexes more than that of the US market, and provide international diversification opportunities for US investors. Similarly, Tsai and Swanson (2009) find evidence that US investors seeking diversification can benefit from investing in ETFs as well as CEFs. In the presence of partial segmentation, country funds returns are a function of not only their benchmark asset, but also factors relating to the US market conditions.

The findings of the paper indicate considerable time variation in risk exposure of country mutual funds to the US and foreign markets risk factors. However, the US market betas suffer greater variation over the sample period than the target foreign market betas. The overall fluctuation in betas for the closed end funds is found to be higher than that for the exchange traded funds, and emerging market funds experience more oscillation in risk exposure than their developed market counterparts. Further, a combination of the US macroeconomic state variables and investors' sentiment can predict conditional betas significantly. Investors would be benefited by recognizing the time varying nature of the investment opportunities and adjusting their portfolio allocation strategies accordingly.

The rest of the paper is organized as follows. Sections 2 and 3 describe data and methodologies, respectively. Results of the two factor models and predictive regressions are presented in Sections 4 and 5. Section 6 concludes the paper.

2. Data descriptions

This paper employs weekly data for a sample of 15 country CEFs and 19 ETFs over the period of January, 2001 to December, 2012, a total of 617 weeks.[4] Weekly observations are employed to avoid the day of the week effect and the problem of non-synchronous trading between the US and overseas markets. The time series of each fund including the recent crisis periods will enable us to study their behavior separately across different economic states, which may be the underlying reason for time varying risk exposure. In developed markets, ETFs consist of countries from Australia, Austria, Belgium, Canada, France, Germany, Hong Kong, Italy, Japan, Netherlands, Singapore, Spain, Sweden, Switzerland, and United Kingdom; and CEFs consist of Australia, Germany, Ireland, Japan, Singapore, and Switzerland. In emerging markets, ETFs consist of countries from Brazil, Malaysia, Mexico, and South Korea; and CEFs consist of India, Indonesia, China, Chile, Mexico, South Korea, Taiwan, Thailand, and Turkey.

Table 1 presents the names of countries, the ticker symbols, their names of funds, the inception dates, percent of premium/discount, and volume for CEFs and ETFs for developed and emerging markets. Premium/discount and volume are based on the averages of the sample period for each fund.[5] As we observe, the volume of the developed market funds are substantially larger than the volume of emerging market funds for both CEF and ETF. An important aspect of the country mutual funds is that they explicitly track a particular country's overall market, rather than its any specific sector (e.g., industrial) or specific style (e.g., growth or small cap stocks). This would help us analyze these mutual funds' returns against each country's benchmark returns, which are calculated based on the MSCI country indexes. These data sets are obtained from the Center for Researches in Security Prices (CRSP).[6]

Table 2 shows the descriptive statistics for the weekly excess returns of the country closed end funds (CEFs) for the developed markets in Panel A and the emerging markets in Panel B. All returns are based on the excess over 3 month Treasury yields. On average, the returns are slightly higher for emerging market funds than for developed market funds. The volatility of returns, as measured by their standard deviation, is generally lower for CEFs tracking the developed markets, ranging between 2.99% (Switzerland) to 4.69% (Ireland). For emerging market funds, this range is between 4.09% (Mexico) to 6.79% (Russia). The Jerque–Bera (JB) normality tests, not reported here, indicate that all returns series are non-normally distributed. The returns series are also highly autocorrected (ρ_{auto}) indicating high persistence in these variables. Mean and standard deviation of returns on the underlying country benchmarks are also presented in Table 2, which are comparable to those of the mutual funds.

In addition, Table 2 presents correlation of the excess returns on the domestic or US market returns (i.e., S&P 500 index) and the foreign market returns. As expected, funds are highly correlated with the foreign market returns, ρ_F, as well as with the US market returns, ρ_{US}. The high correlation between the domestic

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[3] Levy and Lieberman (2013) show that ETS prices are strongly influenced by S&P500 index during non-synchronized hours.

[4] Phengpis and Swanson (2009) also used the same number of ETFs for their study.
[5] Premium/discount is in percentage and calculated as (Price – NAV)/NAV.
[6] We collect the volume data for these funds from Bloomberg.