Pricing of foreign exchange risk and market segmentation: Evidence from Pakistan's equity market[☆]

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A B S T R A C T

This paper undertakes empirical analysis to investigate whether foreign exchange rate risk is priced, and the extent to which the Pakistani equity market is integrated into world equity markets. For the period January 1993–January 2013, we investigate unconditional pricing using the iterated generalized method of moments, employing industry and size portfolios formed from 180 firms traded on the Karachi Stock Exchange. Using the multi beta asset pricing model, we find that exchange risk is priced into the Pakistani equity market over the full sample period. Moreover, we find strong evidence that the Pakistani equity market is segmented from world markets, especially in the post 9/11 period.

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1. Introduction

Emerging markets are considered a separate asset class in having risk-return characteristics that differ from those of the developed markets. However, host countries' economic and political conditions are great obstacles to foreign investors. The stock market in Pakistan has shown remarkable potential for international investors in recent years. In 2002 the Karachi Stock Exchange, the largest stock market of Pakistan was declared the best performing market in the world in terms of the local stock market index. In 2013 it was the second best performing market in the world, recording a 49% rate of return in local currency and 37% in US dollars. This makes the market a potentially important venue for international portfolio investment. However, international portfolio investment comes with an additional source of risk due to currency fluctuations. The interaction between exchange rate risk and stock prices is important when evaluating investment risk in emerging stock markets. The benefit of international investment diversification is greatly reduced during periods of exchange rate volatility. Thus international investors require adequate compensation for bearing foreign exchange rate risk which we expect to be priced into markets.

Table 1
Summary statistics for returns on the KSE100 and MSCI world indexes.

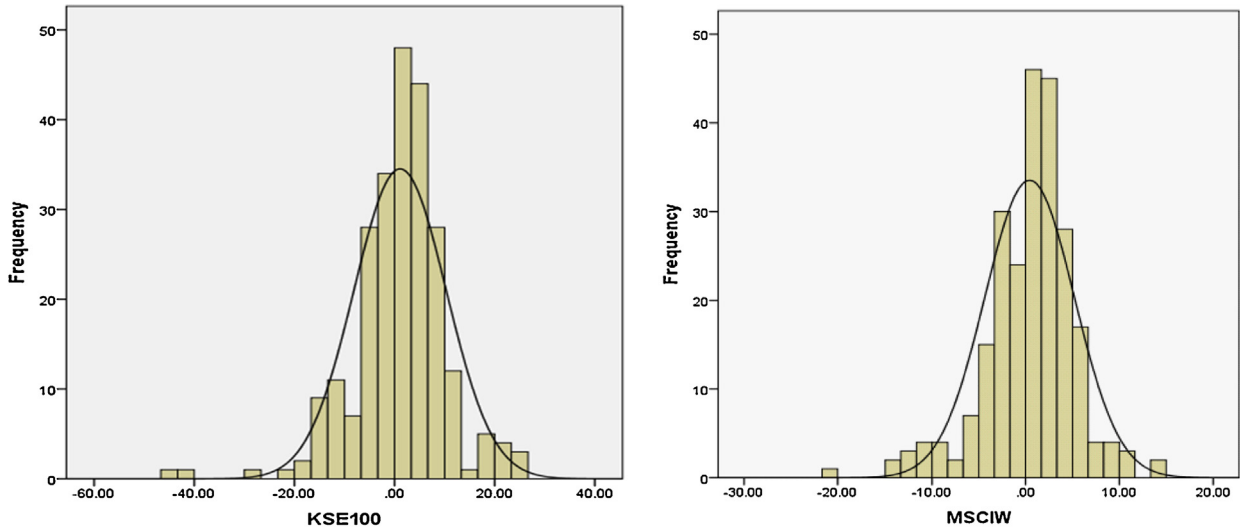|	Mean	Median	Max	Min	St Dev	Skewness	Kurtosis	Jarque–Bera	P-value
KSE100	1.09	1.64	24.90	−44.87	9.24	−0.85	6.88	179.80	0.00
MSCIW	0.41	0.99	13.56	−20.84	4.77	−0.79	5.20	74.60	0.00

Note: Rates of return are measured as %/mo.

Fig. 1. Frequency distributions for returns on the KSE100 and MSCI World indexes.

Accordingly this paper examines the market segmentation and pricing of exchange rate risk in the Pakistani stock market. As reported by Khwaja and Mian (2003) and Iqbal (2012), the Pakistani stock market has typical features of an emerging market such as high returns along with high volatility, high trading volume but low market capitalization, and thicker tails in the distribution of returns. Table 1 presents descriptive statistics for stock returns and Fig. 1 a histogram of the distribution of returns for the Karachi stock market index (KSE100) and the MSCI World index for the period under study, January 1993 to January 2013. The KSE100 index shows much higher returns and higher volatility than the MSCI index. The distribution of returns is more leptokurtic for the Pakistani market as compared to the world market as seen from the histograms and kurtosis values. The spread of KSE100 returns is also much greater than the MSCI returns. The Jarque–Bera normality test shows that normality of returns is strongly rejected for both market indexes.

After the government takeover by military rule in October 1999, Pakistan's economy showed signs of slow and steady progress. The budget deficit was reduced and the Pakistani rupee ceased a plunge dating to US imposition of sanctions following Pakistan's nuclear tests of 1998. The Pakistani rupee was allowed to float on 17 July 2000 after years of fixed and managed float regimes. The change in regime initially saw increased volatility in the nominal exchange rate with a trend decline at about 1.5% per month until September 2001. From this point, the currency began to gain in value against the US dollar.

Using monthly data from the largest equity market in Pakistan, the Karachi stock exchange (KSE), for the period January 1993 to January 2013, we explore whether foreign exchange risk is unconditionally priced in by the market, i.e., whether a significant exchange rate risk premium exists. Additionally, we explore the extent of integration or segmentation of the local market with world equity markets using various specifications of our econometric model.

Previously, others have studied foreign exchange rate risk by considering groups of emerging markets.[1] However, there has been no rigorous econometric study focused on Pakistani equity markets. The present paper is aimed at filling this gap.

The remainder of the paper is organized as follows: Section 2 reviews the literature on foreign exchange risk pricing. Section 3 discusses our analytical methodology involving multifactor models. Section 4 describes the data and presents summary statistics. Section 5 reports the results for different asset pricing models and particular industry portfolios. Section 6 discusses similar results for different size portfolios. Section 7 explores the temporal stability of results. Concluding remarks are provided in Section 8.

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[1] Studies that consider groups of emerging markets includes Glen (2002), Phylaktis and Ravazzolo (2004), and Carrieri and Majerbi (2006).