

# The wealth effects of portfolio rebalancing in emerging equity markets

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## Abstract

This paper analyzes the wealth effects of alternative portfolio rebalancing strategies for equity investments in nine emerging markets for the period from 1976 to 1998. The choice of rebalancing intervals has a large effect on wealth accumulation and the geometric mean return. The difference between no rebalancing and semi-annual rebalancing is 5.87 percentage points per year. Surprisingly, semi-annual rebalancing, which was optimal for this data set, was also 2.62 percentage points per year better than monthly rebalancing. Positive first- and second-degree autocorrelation among the monthly returns appears to account for the decrease in returns for rebalancing more frequently than semi-annually. © 2002 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

The recent performance of emerging market equities has led to doubts among investors and portfolio managers about the desirability of investments in that class of securities. For example, Barry et al. (1998) find that from 1976 to 1997 the International Finance Corporation (IFC) Emerging Market Index underperformed

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the S&P500 by generating lower returns at a higher level of risk. This result differs from previous results. Results reported by Harvey (1995) and results surveyed by Errunza (1997; Errunza and Losq, 1985) indicate that emerging market equities are more volatile than those of developed markets, but that they also deliver higher returns. Wilcox (1997) and Eaker et al. (2001) provide an important counterpoint to the Barry et al. (1998) result. They demonstrate that an equally-weighted portfolio of emerging market equities performed much better than the value-weighted IFC index, and, over roughly the same period as in the Barry et al. (1998) paper, outperformed the S&P500.

One of the other important results in the Eaker et al. (2001) paper concerns the effects of portfolio formation on the long-run rates of return earned in emerging equity markets. That paper showed that the volatilities of the individual markets were very high but that the levels of cross-sectional correlation were very low. As a consequence, equal-weighted diversification substantially reduces portfolio volatility. This reduction has an important impact on the magnitude of the terminal value of the portfolio. Specifically, the mean rate of return (continuously compounded) on an equally-weighted portfolio of emerging markets was materially higher than the equally-weighted average of the mean rates of return of the individual markets. Those results are consistent with the findings of Wilcox (1997) for a broader sample of countries over a shorter time period.

In this paper we examine a related phenomenon: the effect on wealth accumulation of the frequency of portfolio rebalancing. The less frequently a portfolio is rebalanced, the more concentrated its individual positions become as some markets appreciate and others depreciate. We extend the Eaker et al. (2001) results concerning the effects of diversification on the performance of emerging markets by examining the wealth effects of alternative portfolio rebalancing strategies. Using the IFC data for nine emerging markets for the period 1976 to 1998<sup>1</sup> we demonstrate that periodic rebalancing increases the terminal wealth of a portfolio<sup>2</sup>. We also find that the benefits of rebalancing decrease as the frequency of portfolio reallocation increases and actually becomes negative at some point. To determine what causes this pattern of behavior we perform a series of Monte Carlo simulations that indicate that the major influence is the degree of auto-correlation of the returns.

## **2. Data and returns**

The data for this study are the International Finance Corporation (IFC) monthly indices for the nine countries for which the indices are available since 1976. The

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<sup>1</sup> For the entire period data are available for Argentina, Brazil, Chile, Greece, India, Korea, Mexico, Thailand, and Zimbabwe.

<sup>2</sup> This is identical to increasing the geometric mean rate of return and we will report most results in terms of the geometric mean rate of return.

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