International Portfolio Selection and Efficiency Analysis

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Abstract. In the risk-return tradeoff, the traditional mean-variance analysis has been widely used for studies of international portfolio efficiency and diversification. Without prior knowledge about either the parametric structure of assets' return distributions or the form of investors' preference functions, the variance may no longer serve as a suitable risk proxy. This article examines international portfolio efficiency and diversification effects through mean-variance and various distribution-free (or less restrictive) risk-return measures. We show empirically that the mean-variance model is appropriate for large or well-diversified portfolios, but may provide biased results for single assets and less diversified portfolios. While stochastic dominance stands as theoretically the most appropriate method of international portfolio selection and efficiency analysis, the lack of optimal search algorithms reduces its practical usefulness. Very little gain is obtained by using the Gini-mean-difference risk measure as compared to the semivariance measure. The semivariance measure is a powerful and convenient discriminator of risky prospects, while stochastic dominance can serve as a benchmark to justify portfolio efficiency.

Key words: international portfolio efficiency, mean-variance model, risk-return measures, diversification

1. Introduction

Studies of the potential gains to investors from international equity portfolio diversification and the analysis of intercountry integration have received much attention in financial economics. Grubel (1968), Levy and Sarnat (1970), Solnik (1974), Lessard (1973), Agmon and Lessard (1977), Jorion and Schwartz (1986), and Cholerton, Pieraerts and Solnik (1986) have examined the issue of international diversification. The common conclusions of these studies suggest that the merits of diversification result from the interdependence of international capital markets and the low positive or negative correlation that exists between national stock markets. Other studies of world equity markets focus on the comovement structure and integration of equity return distributions among countries. For example, see Granger and Morgenstern (1970), Grubel and Fadner (1971), Ripley (1973), Paton, Lesseg and Joy (1976), Hilliard (1979), Maldonado and Saunders (1981), Philippatos and Christofi (1983), Schollhammer and Sand (1985), Christofi and Philippatos (1987), Fischer and Palasvirta (1990), Hamao, Masulis and Ng (1990), and Becker, Finnerty and Gupta (1990).

In the above studies, researchers attempt to answer one important question: Are investors able to select an optimal investment strategy that can reduce the risk exposure of domestic
investments? Implicitly, these studies impose an assumption that the risk-return structure of intercountry investment is captured by the (intertemporal, daily, weekly, monthly, or annual) correlations of the first two moments (mean and variance) of assets' return distributions. However, we should realize that the widely used two-parameter, mean-variance analysis is valid only when assets' return distribution are fully characterized by the first two distribution moments, or when the investor's preference function is assumed to be quadratic. Without prior information about the parametric structure of international capital return distributions, or investor's risk preferences, using the variance (or covariance) measure may not be a suitable risk proxy for international investments.

Meyer (1987) and Levy (1989) demonstrated that mean-variance analysis is consistent with utility-maximizing behavior for general risk-averse investors, if distributions are different only by the location and scale (LS) parameters. Chamberlain (1983) has shown that the distribution of every asset and portfolio is determined by its mean and variance if and only if the random returns are elliptically and symmetrically (ES) distributed, where the ES family is a special case of the LS distributions. Importantly, this indicates that conventional mean-variance analysis is inappropriate for any distribution that does not satisfy the ES and/or LS conditions, such as the two-parameter lognormal distribution. Other distributional parameters, such as skewness (or coskewness) or higher moments, may play an important role in determining the risk-return tradeoff (see Kraus and Litzenberger, 1976; Friend and Westerfield, 1980; Barone and Adesi, 1985; Sears and Wei, 1988; and Lim, 1989). In addition, risk-averse investors may be concerned only with downside variability or loss reduction (see Markowitz, 1959; Fishburn 1977; Bawa, 1978; Bawa and Lindenberg, 1977; and Harlow and Rao, 1989). This being the case, the variance becomes less intuitively appealing because it considers the extremes on both tails of the distribution as contributing to the risk measure. All the above arguments indicate that using traditional methods in the framework of mean-variance analysis to examine the risk reduction of international diversification may provide misleading results. Therefore, before we answer the question of how effective international diversification is in reducing the risk exposure of portfolio investments, preselection of appropriate risk proxies for intercountry investments is necessary. The present study addresses this issue.

Alternative risk measures with less restrictive distributional (or distribution-free) and/or individual utility function assumptions, including semivariance, lower partial moments, Gini mean difference, and stochastic dominance, have been widely used and discussed in the studies of U.S. financial markets. However, these methods of analyzing the risk exposure in a more general framework than mean-variance analysis have not been applied to international investments. The purpose of this article is to examine portfolio selection and efficiency through international diversification by comparing various portfolio-selection criteria with respect to different risk measures. Since international equity distributions are heterogeneous in that they are affected by different environments, cultures, and economic information, we expect the alternative investment selection criteria to perform better than mean-variance analysis. Our empirical analysis confirms such an expectation for less diversified portfolios and single assets, particularly, under the conditions that about half of international equity distributions in our sample data process significant skewness. However, for well-diversified international portfolios with less idiosyncratic risk exposure, the mean-variance criterion performs as well as the alternative risk-return measures in that the returns