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Int. Fin. Markets, Inst. and Money 13 (2003) 355–381

Journal of
INTERNATIONAL
FINANCIAL
MARKETS,
INSTITUTIONS
& MONEY

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Taiwan stock market and four-moment asset pricing model

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Received 16 November 2001; accepted 29 October 2002

Abstract

This paper provides a detailed investigation of the risk-return characteristics of the Taiwan stock market. First, the stock market and individual stock return distributions were examined for the presence of co-skewness, excess kurtosis and their persistence. Next, a four-moment conditional CAPM was tested in up- and down-market conditions. Results of the investigation show that investors expect a lower (higher) return when the distribution of stock returns demonstrates positive co-skewness (co-kurtosis). In addition, results show evidence of the relative importance of the co-skewness and the co-kurtosis risks, compared with that of the covariance risk in explaining stock return variations. This is particularly evident over the up-market subperiods.

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Keywords: Co-skewness; Co-kurtosis; Four-moment CAPM; Market conditions; Risk-return

JEL classification: G11; G18

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doi:10.1016/S1042-4431(03)00013-1

1. Introduction

Traditional mean-variance based CAPM is one of the few theoretical models that has substantial influence on practical finance. It is extensively applied as a benchmark for performance evaluation and measurement of abnormal returns. Large volumes of research exist on the test of the risk-return relationship based on the Sharpe–Lintner (standard) version of (two-moment) CAPM. The noteworthy implication of this model is that investors are only compensated for bearing the systematic covariance risk. The product of beta and risk premium determines the amount of compensation. Lately, many economists have cast doubt on the explanatory power of the market portfolio or beta in determining stock returns. Most notably, Fama and French (1992) found that other variables, such as firm size and book-to-market ratio, capture cross-sectional variations in common stock returns better than the beta.

A number of authors have investigated the inadequacy of the mean-variance approach and have added the third moment of the return distribution to account for investors' preference for positive skewness. Jean (1971, 1973), Arditti (1971) and Arditti and Levy (1975) investigated the relationship between skewness and return of individual securities and portfolios. Francis (1975) showed that total skewness is not priced. However, Kraus and Litzenberger (1976) argued that systematic skewness (co-skewness) and not the total skewness is relevant for the market model. Additional three-moment CAPM research by Simkowitz and Beedles (1978), Friend and Westerfield (1980), Barone-Adesi (1985), Sears and Wei (1985), Tan (1991), Lim (1989), Chunhachinda et al. (1997), Peiro (1999), Harvey and Siddique (1999, 2000) explored the importance of skewness in asset pricing. Sears and Wei (1988) emphasized that ignoring the co-skewness risk may bias the estimates in tests for the risk-return trade-off. Mandelbrot (1963) and Fama (1963) conjectured that the stock returns may have fat tails. Recently, Fang and Lai (1997) found that investors are compensated for bearing the systematic co-kurtosis risk, as well as the systematic covariance and co-skewness risks with higher expected returns. However, this remains a matter of debate: "Should co-skewness and co-kurtosis risk measures (third and fourth moments of return distribution) be added to supplement to the covariance risk?" A persuasive argument can be made that an asset-pricing model for emerging market returns must include the co-skewness and co-kurtosis risk.

While much research has investigated the investor preferences for positive skewness and kurtosis in developed equity markets, only a few have studied the issue in emerging markets³. The plausible reasons for the lack of studies may be due to the characteristics of emerging markets or relative newness. Hartmann and Khambata (1993) found emerging markets to have low market capitalization, a smaller number of listed stocks, low trading volume and turnover, market domination by a few large stocks, and high volatility. Korajczyk (1996) and Bakaert

³ A study of the risk-return trade-off in emerging markets provides valuable insights into investors' behaviors in transitional economies.

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