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Empirical evidence of conditional asset pricing in the Indian stock market



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ABSTRACT

Studies of various alternative empirical asset pricing models have mostly concentrated on developed markets. However, despite the importance of this issue, surprisingly little is known about how different asset pricing models behave in emerging capital markets. The purpose of this paper is to determine the suitability of conditional compared to unconditional versions namely, the capital asset pricing model and the Fama-French three-factor model for the Indian stock market. The key distinction between the present empirical tests and previous tests is the application of the Kalman filter method for dynamic beta estimation in the Indian market. The findings indicate that the cross-sectional variation in expected returns is driven by mainly two firm characteristics size and book-to-market ratio. Unlike the unconditional model, the market beta is able to capture the variation of expected return in conditional model. The results imply that information has a role and investors use the prior belief and macroeconomic variables as predictive variables to determine the cost of capital. These results are supported by some recent findings that Fama-French three-factor model is the only multifactor model that consistently sources three different types of risk included in the list of anomalies.

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1. Introduction

The capital asset pricing model (CAPM) developed by Sharpe and Lintner has long been a backbone of financial theory. Past research provides mixed evidence on the validity of the model. Gradually, since the 1970s, a number of studies have suggested various alternatives to improve the explanation of the risk-return trade-off by relaxing some of the assumptions in standard CAPM. A number of empirical research in finance have focused on firm specific characteristic that explain the cross-section of expected return better than the traditional asset pricing models. Subsequent work by number of researchers suggest that cross-sectional variation in average returns are explained not only by the systematic risk or beta as described by the CAPM, but also by earnings-price ratios, size, book-to-market and debt-equity ratios. Fama and French (1993) designed a three-factor model arguing that the market beta alone is not sufficient to measure the risks of common stocks. In their three-factor model, expected return is determined by firm-level characteristics, i.e., market capitalization or size, and book-to-market factor in addition to market beta. Another reason why the performance of traditional CAPM is poor may be due to the static unconditional nature of the model. A CAPM is defined as conditional when the market risk premium and the systematic risk of an asset are sensitive to information that affects the market's conditional expected returns. A conditional CAPM retains the basic structure of the CAPM but allows for time-variation of the risk premium and the systematic risk of an asset sensitive to information that affects the market's conditional expected returns.

Studies of various alternative empirical asset pricing models have mostly concentrated on developed markets. In the context of emerging markets, risk differs between emerging and developed markets. Unlike developed markets, emerging markets are subject to frequent regime changes with reversals in fiscal, monetary and trade policies and hence, the average output volatility of emerging economies are higher compared to developed ones (Aguilar and Gopinath, 2007). This source of volatility is due to the liberalization of the economy to more openness followed by high growth and a sharp increase in the integration of both trade and financial flows (Ghate et al., 2013). Therefore, evaluation of alternative class of asset pricing studies gains importance for emerging markets. However, despite the importance of this issue, surprisingly little has been researched about how different asset pricing models behave in emerging capital markets. In this paper, we evaluate the performance of alternative class of asset pricing models namely, unconditional and conditional versions of the CAPM and the FamaFrench three-factor model for the Indian stock market. The main focus of this paper is to determine the suitability of conditional asset pricing models over unconditional asset pricing models in order to explain the variations of expected return across different securities. The capital market of India is well developed and plays an important role in the sub-region. All major financial institutions and foreign investors participate in the Indian capital market. Therefore, it is important to understand asset pricing behavior in the Indian market. The present paper also contributes by extending the current study by undertaking conditional version of asset pricing model for which limited evidence has been found in the literature of asset pricing in India. One of the key contributions of this paper is the application of the Kalman filter method for dynamic beta estimation of the Indian market.

In this paper, the empirical tests are performed on 25 portfolios sorted by size and book-to-market equity using the Fama-MacBeth cross-sectional regression. In order to capture the beta dynamics precisely, we follow the dynamic beta model of Ghysels and Jacquier (2006), which combines the robustness of data-driven filters with the power of statistical methods to estimate beta dynamics. The unobserved betas follow a stochastic rather than a non-stochastic beta and are modeled as functions of observable economic variables such as dollar exchange rate, index for industrial production (IIP) and term spread. These characteristics of the beta have typically been ignored in the empirical literature.

We find that market beta in unconditional asset pricing model do not suitably describe the asset pricing behavior of the Indian capital market. However, unlike previous studies on emerging markets, the market beta provides evidence in favor of conditional model. Moreover, irrespective of the conditioning information, the size and book-to-market factors are consistently significant and positive for three-factor model. The conditional version of the asset pricing model works better

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