

On the Time-Varying Structure of the Arbitrage Pricing Theory using the Japanese Sector Indices

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Abstract

This paper is the first study to examine the time instability of the APT in the Japanese stock market. In particular, we measure how changes in each risk factor affect the stock risk premiums to investigate the validity of the APT over time, applying the rolling window method to Fama and MacBeth's (1973) two-step regression and Kamstra and Shi's (2023) generalized GRS test. We summarize our empirical results as follows: (1) the APT is supported over the entire sample period but not at all times, (2) the changes in monetary policy greatly affect the validity of the APT in Japan, and (3) the time-varying estimates of the risk premiums for each factor are also unstable over time, and they are affected by the business cycle and economic crises. Therefore, we conclude that the validity of the APT as an appropriate model to explain the Japanese sector index is not stable over time.

Keywords: Time-Varying Coefficient; Arbitrage Pricing Theory; Multi-Factor Model; Macroeconomic Risk; Generalized GRS Test.

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