

Applying the three-factor model of Fama and French to Japan: Insights from the Japanese Stock market using daily data

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Executive Summary

This paper investigates the feasibility of the Fama and French three-factor model (1993) using daily data on Japanese stocks listed on the Tokyo Stock Exchange (TSE) over the period from 1990 to 2010. The empirical findings generally lend support to the three-factor model. Portfolios constructed to mimic risk factors related to size (*SMB*) and book-to-market value (*HML*) absorb common variation in stock returns and thus proxy for common risk factors. Further, taking together the market factor and the factors related to size and book-to-market value, they do a good job explaining the cross-sectional variation in average returns. But contrary to the findings of Fama and French, the book-to-market related factor *HML* seems to be less important for the explanatory power of the model than the other two factors.

1 Introduction

The development of a narrow but well-performing asset pricing model has been one of the major tasks in financial economics over the past few decades. Despite the numerous theoretical models that have been derived to date, still none of them has widely been accepted by academics and practitioners. The primary reason for this is that empirical findings regularly contradict these models. The traditional Capital Asset Pricing Model (CAPM) is not exempt from this either. In recent times, research on asset pricing is increasingly based on empirical rather than theoretical analysis. Financial economists have struggled to elaborate a statistical framework that explains the behaviour of asset prices. The three-factor model of Fama and French (1993) is one popular model that has emerged from this effort. It owes its popularity to the empirical success and relative ease of application. The authors start from their preceding observation that several empirical findings violate the simple linear relationship between excess returns and exposure to market risk, specified by the CAPM.¹ Some variables, while being minor in asset pricing theory, exhibit reliable power to describe the cross-section of average returns. They point out the particularly strong role of firms' market capitalization, which is labeled size, and book-to-market ratio, which is labeled value.² It is suggested that size and value are related to economic fundamentals and thus might proxy for systematic risk factors in returns. It is argued that on the one hand small firms can suffer long earnings depressions that bypass big firms and that on the other hand firms with high book-to-market ratios tend to generate persistently lower earnings than firms with low ones. Based on that, they propose a three-

¹ See Fama and French (1992).

² Among others, Banz (1981) and Reinganum (1981) previously found a negative relation between size and average returns; Stattman (1980) and Rosenberg, Reid, and Lanstein (1985) found a positive relation between book-to-market ratio and average returns.