

WEI

BOSTON, USA,
AUGUST 01-03,
2018

2018 WEI
INTERNATIONAL
ACADEMIC
CONFERENCE PROCEEDINGS

BUSINESS & ECONOMICS

BY THE WEI | ISSN 2167-3179 (ONLINE) USA

IS THE FAMA & FRENCH FIVE-FACTOR MODEL REALLY REDUNDANT? A WAVELET MULTI-SCALING APPROACH

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ABSTRACT

Estimating the relationship between risk factors and portfolio returns has been a critical issue since CAPM was proposed by William Sharpe in 1964. The pioneer researchers, Fama and French, have important studies to investigate these relationships such as free-factor asset pricing model. These models are commonly used to explain the cross-sectional variation in average stock returns over various times. Recently, Fama and French propose a new five-factor asset pricing model that captures size, value, profitability and investment patterns (FF, 2015;2016;2017). Although their five-factor model performs better in capturing the size, value, profitability, and investment patterns than the other FF models, they emphasized that the addition of profitability and investment factors is redundant for describing average returns. Most of the existing studies, including the FF, have used ordinary least square method to estimate the models. However, there are plenty of studies which indicate the relationship between risk factors and average returns might be different. On this perspective, the motivation of this study is to investigate whether the five-factor model is really redundant or not by using a different approach. For this purpose, the different approach which proposed by In and Kim (2013) is used. The approach is based on the wavelet multi-scaling method that decomposes a given time series on a scale-by-scale basis. Every scale represents a proxy of various investment horizons for investors. The data gathered from Kenneth French's website. Left-hand-side (LHS) of monthly data contains 18 average value weighted portfolios formed on the ratio of book equity to market equity, operating profitability and investment. Right-hand-side (RHS) of monthly data contains five factors which are (Rmt-

Rft), SMBt, HMLt, RMWt, CMAt. The first empirical GRS test results reveal that significance levels of intercept estimates change based on the different scales (investment horizons). Moreover, while the original model's GRS test statistics easily rejects the five-factor model directed at capturing patterns, the GRS test statistics were calculated based on decomposed series cannot reject. On the other hand, the impact of profitability and investment factors on average returns differ in not only various formed portfolios but also the scale-by-scale basis. According to the initial results of our study, it is hard to say that the five-factor model is redundant for all type of investment horizons.

Keywords: Five-factor model, asset pricing, wavelet, multi-scaling approach

JEL Codes: G11, G12, C14