University of
Zurich^UZH

Department of Banking and Finance
Chair for Financial Economics

MASTER'S THESIS

Four-Moment CAPM: Evidence and Application for the Swiss Market

Supervisors:

PROF. DR. FELIX KÜBLER

RUNJIE GENG

Author:

Ivan KRALJEVIC

Submission Date: May 29, 2018

Executive Summary

Markowitz's 1952 paper laid the groundwork for the valuation of risky assets by introducing the mean-variance framework. The Capital Asset Pricing Model (CAPM) followed soon after. This was proposed by Sharpe (1964), Lintner (1965), and Mossin (1965), and set a milestone in the modern finance theory. Since then, most contributions to decision making theory and portfolio analysis are based on Markowitz's mean-variance parameters.

In this context, investment strategies should only consider the return distribution's first two moments. In reality, these assumptions neither correspond to the characteristics of asset returns, nor to investor preferences, unless investor preferences are quadratic functions (Sihem and Slaheddine (2014)). Results from Perio (1999) indicate that asset returns distributions are asymmetric and leptokurtic. As return distributions of risky assets are not symmetrical, Rubinstein (1973) was the first to introduce an assessment method for financial assets using higher statistical moment. Jurczenko and Maillet (2006) derived the four-moment CAPM which is this thesis' subject.

While several stock markets have been under scrutiny, the results from the Swiss stock market have been missing from academic analysis. Therefore, this thesis aims to fill this gap in the research by analysing the Swiss market. In the first part, this thesis addresses the theoretical framework as given by Jurczenko and Maillet (2006), and compares the model with more established ones like that of Fama and French (1992) and Carhart (1997). Aligned with my expected results, the cross-sectional results will show that there is quite clear evidence for the existence of the three risk premia: covariance, coskewness and cokurtosis. Moreover, despite some smaller collinearity issues with the size, value and momentum factor, the output remains statistically very significant, meaning that the models can be used as complements rather than as substitutes.

While the first part of this thesis argues that the existence of the four-moment CAPM seems to be statistically justified, the second part explores the question whether one can systematically yield pure co-moment risk premia by using a feasible investment strategy,

creating pure exposure in the desired factors.

The results seem rather sobering, despite multiple changes in different dimensions. As none of the returns are statistically different from those on the more common confidence levels, the source of inefficiencies may have different origins. However, further tests reveal that the correlation between the independently constructed portfolios is fairly high. This implies that the main performance driver throughout the sets of portfolios must be the same, which in turn must be sourced from the co-moment risk premia.

Although the four-moment CAPM has been subject to a number of studies, a comparison between the traditional CAPM and the four moment CAPM reveals that there are still unanswered questions. Despite insignificant results provided by the investment strategy, the theoretical part has shown the importance of the co-moments, which could be used for amending, explaining or understanding existing models.