Conditional Betas, Higher Comoments and

the Cross-Section of Expected Stock Returns

by

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

To my parents

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Abstract

This thesis examines the performance of different models of conditional betas and higher comoments in the context of the cross-section of expected stock returns, both in-sample and out-of-sample.

I first examine the performance of different conditional market beta models by using monthly returns of the Fama-French 25 portfolios formed by the quintiles of size and book-to-market ratio in Chapter 3. This is a cross-sectional test of the conditional CAPM. The models examined include simple OLS regressions, the macroeconomic variables model, the state-space model, the multivariate GARCH model and the realized beta model. The results show that the state-space model performs best in-sample with significant betas and insignificant intercepts. For the out-of-sample performance, however, none of the models examined can explain returns of the 25 portfolios.

Next, I examine the recently proposed realized beta model, which is based on the realized volatility literature, by using individual stocks listed in the US market in Chapter 4. I extend the realized market beta model to betas of multi-factor asset pricing models. Models tested are the CAPM, the Fama-French three-factor model and a four-factor model including the three Fama-French factors and a momentum factor. Realized betas of different models are used in the cross-section regressions along with firm-level variables such as size, book-to-market ratio and past returns. The in-sample results show that market beta is significant and additional betas of multi-factor models can reduce although not eliminate the effects of firm-level variables. The out-of-sample results show that no betas are significant. The results are robust across different markets such as NYSE, AMEX and NASDAQ.

In Chapter 5, I test if realized coskewness and cokurtosis can help explain the cross-section of stock returns. I add coskewness and cokurtosis to the factor pricing models tested in Chapter 4. The results show that the coefficients of coskewness and cokurtosis have the correct sign as predicted by the higher-moment CAPM theory but only cokurtosis is significant. Cokurtosis is significant not only in-sample but also out-of-sample, suggesting

cokurtosis is an important risk. However, the effects of firm-level variables remain significant after higher moments are included, indicating a rejection of higher-moment asset pricing models. The results are also robust across different markets such as NYSE, AMEX and NASDAQ.

The overall results of this thesis indicate a rejection of the conditional asset pricing models. Models of systematic risks, i.e. betas and higher comoments, cannot explain the cross-section of expected stock returns.

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Abbreviations

AMEX	American Stock Exchange
APT	Arbitrage Pricing Theory
AR	Auto Regression
ARCH	Auto Regressive Conditional Heteroskedasticity
ARMA	Auto Regression Moving Average
BM	Book-to-Market Ratio
CAPM	Capital Asset Pricing Model
CAY	Consumption-to-Wealth Ratio
CML	Capital Market Line
CRSP	The Centre for Research in Security Prices
D/E	Debt-to-Equity Ratio
DCC	Dynamic Conditional Correlation
FF3F	Fama-French Three-Factor Model
GARCH	Generalized Auto Regressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
GLS	Generalized Least Squares
GMM	Generalized Methods of Moments
ICAPM	Intertemporal Capital Asset Pricing Model
MA	Moving Average
MCMC	Markov Chain Monte Carlo
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
P/E	Price-to-Earnings Ratio
WLS	Weighted Least Squares