Bocconi
Università Commerciale Luigi Bocconi

Department of Decision Sciences

Statistics Seminar

Time-Varying Beta: a boundedly rational equilibrium approach

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Abstract

By taking into account conditional expectations and the dependence of the systematic risk of asset returns on micro- and macro-economic factors, the conditional CAPM with time-varying betas displays superiority in explaining the crosssection of returns and anomalies in a number of empirical studies. Most of the literature on time-varying beta is motivated by econometric estimation rather than explicit modelling of the stochastic behaviour of betas through agents' behaviour. Within the mean-variance framework of repeated one-period optimisation, we set up a boundedly rational dynamic equilibrium model of a financial market with heterogeneous agents and obtain an explicit dynamic CAPM relation between the expected equilibrium returns and time-varying betas. By incorporating the three most popular types of investors, fundamentalists, chartists and noise traders, into the model, we show that, independent of the fundamentals, there is a systematic change in the market portfolio, risk-return relationships, and time varying betas when investors change their behaviour, such as the chartists acting as momentumtraders. In particular, we demonstrate the stochastic nature of time-varying betas and show that the commonly used rolling window estimates of time-varying betas may not be consistent with the ex-ante betas implied by the equilibrium model. The results provide a number of insights into an understanding of time-varying beta.

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