The risk-return tradeoff: A COGARCH analysis of Merton’s hypothesis

Abstract:
We analysed daily returns of the CRSP value weighted and equally weighted indices over 1953–2007 in order to test for Merton’s theorised relationship between risk and return. Like some previous studies we used a GARCH stochastic volatility approach, employing not only traditional discrete time GARCH models but also using a COGARCH - a newly developed continuous-time GARCH model which allows for a rigorous analysis of unequally spaced data. When a risk–return relationship symmetric to positive or negative returns is postulated, a significant risk premium of the order of 7–8% p.a., consistent with previously published estimates, is obtained. When the model includes an asymmetry effect, the estimated risk premium, still around 7% p.a., becomes insignificant. These results are robust to the use of a value weighted or equally weighted index. The COGARCH model properly allows for unequally spaced time series data. As a sidelight, the model estimates that, during the period from 1953 to 2007, the weekend is equivalent, in volatility terms, to about 0.3–0.5 regular trading days.

Stichworte:
Continuous-time GARCH Modelling, Market Risk, Pseudo-Maximum Likelihood, Risk Free Rate, Risk Premium, Stochastic Volatility

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