Hao Li's projects

Project 1 A Generalized CAPM with Asymmetric Power Distributed Errors with an Application to Portfolio Construction

Authors: Te Bao, Cees Diks, Hao Li

Categories: Social Science

Group: Quantitative Economics

Item type: "not sure"

Keyword(s): CAPM; Non-Gaussian distribution; Asymmetric fat-tailed distributions; Minimum variance portfolio

Description: We use the total return index from Datastream (Thomson Reuters). As recommended by the European Money Markets Institute (EMMI), we use the Euro Interbank Offered Rate (Euribor) and the Euro OverNight Index Average (Eonia) as proxies of the risk-free rate to take into account the effects of tax, regulatory, and liquidity conditions for the European market. Besides, Eonia is used as the risk-free rate for the realized daily returns. The data were retrieved on 24 May 2016. We estimate the CAPM model on European stock market data, allowing for asymmetric and fat-tailed return distributions using independent and identically asymmetric power distributed (IIAPD) innovations. The results indicate that the generalized CAPM with IIAPD errors has desirable properties. It is substantially less likely to be rejected than the traditional CAPM with normally distributed errors and, moreover, backtests show that portfolios constructed using IIAPD errors outperform the portfolio constructed with normally distributed errors in terms of commonly-used performance measures.

Funding: Hao Li wishes to thank the China Scholarship Council (CSC) for the financial support.

Retention period: follow UvA policy.

Project 2 Predicting Intraday Return Patterns based on Overnight Returns for the US Stock Market

Authors: Hao Li, Cees Diks, Valentyn Panchenko

Categories: Social Science

Group: Quantitative Economics

Item type: "not sure"

Keyword(s): Overnight returns; Intraday returns; High-frequency trading; Nonlinear dependence; Day trading

Description: We use data from NYSE Trade and Quote (TAQ) database of Wharton Research Data Services. This database contains intraday transactions data in two databases, Consolidated Quote database for intraday quotes and Consolidated Trade database for intraday quotes, for all securities listed on the New York Stock Exchange (NYSE) and American Stock Exchange (AMEX), as well as Nasdaq National Market System (NMS) and SmallCap issues. UvA has not subscribed this transactional-level database. Valentyn Panchenko provided the raw data. This paper investigates predicting intraday return patterns conditional on observed overnight returns. Based on TAQ data, we find evidence for dependence between overnight returns and subsequent intraday first and last half-hour return patterns for the S&P 500 Exchange-Traded Fund for the time period from 2003 to 2013 with both statistical and economic significance. Our methodology allows studying the return patterns documented in the existing theoretical and empirical literature in more detail. Moreover, we find that both the first and the last half-hours offer trading opportunities for day traders. Specifically, 20-minute after the market opens and the last 30-minute before the market closes seem to be the best holding periods for investors in terms of annualized returns, Sharpe ratios, and Certainty Equivalent Returns.

Funding: Hao Li wishes to thank the China Scholarship Council (CSC) for the financial support.

Retention period: follow UvA policy.

Project 3 Modeling and forecasting serially dependent yield curves

Authors: Hao Li

Categories: Social Science

Group: Quantitative Economics

Item type: “not sure”

Keyword(s): Yield curve; Dimension reduction; Functional principal component analysis; Factor model; Term structure

Description: I propose a new factor model to estimate and forecast yield curves based on factors driving this serial dependence. In my semiparametric approach, factor loadings are related to the autocovariance functions of the continuous and smooth function of the yield curve subject to unobservable errors. The dynamic evolution is driven by a vector autoregression for a small set of factors. The number of factors and aggregation of information over different lags are determined by the yield data. Applying this method to monthly US government bond yields from January 1985

through December 2020, I find that the dynamic structure of yield curves reduces to a vector process lying in a 3-dimensional space, with 1-month lag information. Yield curve residuals from this new model exhibit less autocorrelation than those obtained from the alternative three-factor models. Moreover, this new model provides favorable forecasting results. The monthly US government bond yield data was downloaded from https://sites.google.com/view/jingcynthiawu/yield-data on 12 June 2020. I selected 17 maturities of 3, 6, 9, 12, 15, 18, 21, 24, 30, 36, 48, 60, 72, 84, 96, 108, and 120 months from the raw dataset.

Funding: no funding.

Retention period: follow UvA policy.