

Quantitative Financial Economics

Matlab tutorials

Problem set on mutual fund performance evaluation

Make a performance evaluation of the 18 Danish globally oriented mutual funds shown below based on monthly net excess returns over the period 2000:12 to 2010:11. rm denotes the excess return on the MSCI World Index. The returns are measured in excess of the 1-month CIBOR rate. smb and hml denote the Fama-French small-minus-big and high-minus-low factors obtained from Kenneth French's data library for developed markets. Except for smb and hml , the data corresponds to the data used in the Matlab program already available on Blackboard. Consequently, the problems are a natural extension of the performance evaluation performed in that program and you can solve the problems in this problem set by making proper adjustments of the already provided program.

Variable	Description	Variable	Description
rm	MSCI World Index	m_9	Jyske Invest Globale Aktier
smb	Small-minus-big factor	m_10	Laan og Spar Invest
hml	High-minus-low factor	m_11	Nordea Invest Aktier
m_1	Bank Invest	m_12	Nordea Invest Aktier II
m_2	Alm. Brand Invest	m_13	Nordea Invest Global Vækst
m_3	Carnegie World Wide	m_14	Nordea Invest Verden
m_4	Danske Invest Global Indeks	m_15	Nykredit Invest
m_5	Danske Invest Global Indeks 2	m_16	Skagen Global
m_6	Danske Invest Global Stockpicking	m_17	Skagen Vækst
m_7	Danske Invest Global Stockpicking 2	m_18	Sydinvest
m_8	Handelsinvest		

1. Evaluate the performance of the mutual funds using the Fama-French 3-factor benchmark model

$$R_{it} - R_{ft} = \alpha_i + b_i(R_{Mt} - R_{ft}) + s_iSMB_t + h_iHML_t + \varepsilon_{it}, \quad i = 1, \dots, 18$$

where $R_{it} - R_{ft}$ denotes the excess return on the i 'th mutual fund, $R_{Mt} - R_{ft}$ the excess return on the MSCI World Index, SMB_t the small-minus-big factor, and HML_t the high-minus-low factor. Report the estimated coefficients, relevant

t -statistics and the R^2 values. Furthermore, implement the bootstrap procedure by Kosowski et al. (2006) using the Fama-French 3-factor model. Compare the results to those using only the CAPM as benchmark model.

2. Using the Fama-French 3-factor benchmark model, implement the Fama and French (2010) bootstrap in order to evaluate the performance of the mutual funds. Compare the results to those using the Kosowski et al. (2006) bootstrap in problem 1.
3. Estimate the Treynor and Mazuy (1966) model

$$R_{it} - R_{ft} = \alpha_i + b_{0i}(R_{Mt} - R_{ft}) + b_{1i}(R_{Mt} - R_{ft})^2 + \varepsilon_{it}$$

for each of the mutual funds in order to separate selection skills ($\alpha_i > 0$) from market timing skills ($b_{1i} > 0$). Report the estimated coefficients, relevant t -statistics and the R^2 values. Furthermore, implement the bootstrap procedure by Kosowski et al. (2006) using this benchmark model. Compare the results to those using the CAPM (without market timing) as benchmark model.