Assignment 2

Due 28/11/2019

In the recent finance literatures, it is suggested that asset prices are well described by a so-called factor model. According to Capital Asset Pricing Model (CAPM: Model (1)), excess return of particular stock is linearly explained by excess returns of the market portfolio.

CAPM: $$r_{jt} = \alpha_j + \beta_{j1} r_{mt} + \varepsilon_{jt} \quad (1)$$

Where: r_{jt} = excess return on portfolio j at time t and
j = 1, 2, …., 25 portfolios categorized by five groups of firm size and five groups of value of the stock.
r_{mt} = excess return on market portfolio at time t – representing market risk premium.

However, some other literatures have claimed that macroeconomic factors play important role in determining the return of the portfolio. Then, the model should be Arbitrage Pricing Model (APM: Model (2)) as

APT: $$r_{jt} = \alpha_j + \beta_{j1} r_{mt} + \gamma_{j2} r_{\text{int}t} + \gamma_{j3} r_{fxt} + \gamma_{j4} r_{goldt} + \gamma_{j5} r_{oilt} + \varepsilon_{jt} \quad (2)$$

Where: r_{intt} = interest rate at time t – expected to have negative relationship.
r_{fxt} = change in exchange rate at time t – expected to have negative impacts.
r_{goldt} = change in gold price at time t –expected to have negative impacts.
r_{oilt} = change in oil price at time t –expected to have negative impacts.

From the data set ***assign02.dta***:

(1) Regress CAPM (Model (1)) and APM (Model (2)). Make interpretation of the estimated results.
(2) From estimated results of APM, test whether there exists a significant first order autocorrelation problem in the estimated regression model. In case of autocorrelation problem, what are the consequences of the problem? And how can we solve the problem.
(3) From estimated results of APM, without solving autocorrelation problem, determine whether there exists serious multicollinearity problem. Should any independent variables in model (2) be dropped? Why? Give explanation of your decision.
(4) From estimated results of APM, after solving autocorrelation problem, determine whether there exists serious multicollinearity problem. Should any independent variables in model (2) be dropped? Why? Give explanation of your decision.