Assignment 1

Due 12/9/2019

From the given data set, estimate the following models:

Capital Asset Pricing Model (CAPM)

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

Fama & French three-factor Model (FF)

Fama & French: $$r_{jt} = \alpha_j + \beta_{j1} r_{mt} + \beta_{j2} r_{smbt} + \beta_{j3} r_{hmlt} + \varepsilon_{jt} \quad (2)$$

Where:
- r_{jt} = excess return on portfolio *j* at time *t* and
- r_{mt} = excess return on market portfolio at time *t* – representing market risk premium.
- r_{smbt} = return on a small-stock portfolio minus the return on a large-stock portfolio (Small Minus Big) at time *t* – representing size premium.
- r_{hmlt} = return on a value-stock portfolio minus the return on a growth-stock portfolio (High Minus Low) at time *t* – representing value premium.

(1) Determine whether there exists significant Jensen Alpha.
(2) Determine whether portfolio *j* has the same risk as the market.
(3) Determine whether there exists significant size premium.
(4) Determine whether there exists significant growth (value) premium.
(5) Compare CAPM and FF models and determine which model is the most appropriated model. why?

To study calendar effect (January effects) from the data set, estimate the following models:

$$r_{jt} = \alpha_j + \gamma_j D_{1t} + \beta_{j1} r_{mt} + \beta_{j2} r_{smbt} + \beta_{j3} r_{hmlt} + \varepsilon_{jt} \quad (3)$$

where: D_{1t} = 1 on January and = 0 otherwise.

(6) Determine whether there exist significant January effects.
(7) Make interpretation of estimated result of model (3) (including (1) sign, (2) overall test, (3) R-square, and (4) individual test).
(8) Perform Chow-test whether January and other month share the same structure of the Fama-French model (2).