

Assignment 2

Due 22/11/2016

From the given data set Assign02.dta, estimate the following models:

Capital Asset Pricing Model (CAPM)

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

Fama & French three-factor Model (FF)

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

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.

From Model (1):

- (1) Determine whether there exists significant abnormal excess return (Jensen Alpha) using t-test & F-test. State null hypothesis of the test.
- (2) Determine whether portfolio j has the same risk as the market portfolio using t-test & F-test. State null hypothesis of the test.

From Model (1) & (2):

- (3) Determine whether there exists significant size premium using t-test & F-test. State null hypothesis of the test.
- (4) Determine whether there exists significant growth (value) premium using t-test & F-test. State null hypothesis of the test.
- (5) Compare CAPM and FF models and determine which model is the most appropriated model. Why? State null hypothesis of the test.

To study calendar anomaly, Monday effects and reverse Monday effects, from the data set, estimate the following models:

$$r_{jt} = \alpha_j + \gamma_{j2} D_{2t} + \gamma_{j3} D_{3t} + \gamma_{j4} D_{4t} + \gamma_{j5} D_{5t} + \varepsilon_{jt} \quad (3)$$

and
$$r_{jt} = \alpha_j + \gamma_{j1} D_{1t} + \gamma_{j5} D_{5t} + \varepsilon_{jt} \quad (4)$$

- (6) Compare model (3) and (4), what are the differences (in term of meaning) between the two models?

- (7) From model (4), determine whether there exist (a) significant Monday effects, and (b) significant reverse Monday effects. State null hypothesis of the test.

To test whether there exist Monday effects in CAPM model (1), estimate the following model

$$r_{jt} = \alpha_j + \gamma_{j0}D_{1t} + \beta_{j1}r_{mt} + \varepsilon_{jt} \quad (5)$$

and
$$r_{jt} = \alpha_j + \gamma_{j0}D_{1t} + \beta_{j1}r_{mt} + \gamma_{j1}D_{1t}r_{mt} + \varepsilon_{jt} \quad (6)$$

- (8) From model (5), determine whether intercept term of CAPM on Monday is different from other days. State null hypothesis of the test.
- (9) Perform hypothesis test whether Monday and other days share the same structure of the CAPM model. State null hypothesis of the test. Based on your conclusion, specify estimated results of CAPM on Monday and CAPM on other days.