Assignment Panel Data

Due 26/4/2018

The study on capital structure of Thai companies listed in the stock exchange market of Thailand (SET) employs the following regression models:

1. Panel Data Model

$$y_{it} = \alpha + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \beta_6 x_{6it} + \beta_7 x_{7it} + u_{it} \quad (1)$$

where:
y_{it} = leverage of firm *i* in year *t*
x_{1it} = size of firm determined by log of total revenue
x_{2it} = tangibles asset of the firm determined by log of tangible assets plus inventories divided by total book assets
x_{3it} = profitability index determined by return on assets
x_{4it} = non-debt tax shields determined by depreciation divided by total assets
x_{5it} = growth rate of the firm determined by book value of asset plus market value of equity minus book value of equity then divided by book value of asset
x_{6it} = risk of the firm determined by square of deviation from mean of return on asset at period *t*
x_{7it} = dividend payment equals to 1 if firm paid dividend at period *t* or equals to 0 if no dividend paid

2. Fixed Effects Model

$$y_{it} = \alpha_i + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \beta_6 x_{6it} + \beta_7 x_{7it} + u_{it} \quad (2)$$

where:
α_i = Cross-sectional fixed effects

3. Random Effects Model

$$y_{it} = \alpha + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \beta_6 x_{6it} + \beta_7 x_{7it} + u_{it} \quad (3)$$

and $u_{it} = v_i + \varepsilon_{it}$

where: v_i = Cross-section random effects
ε_{it} = residual terms

From the given data set (assign_paneldata):
Estimate the above three models including Panel Least Squares model, Fixed effects model, and Random-effects model. Perform fixed effects tests and random effects test, also state null hypothesis of the tests. Then, determine the most appropriated model. Also, give explanation of the choosing criterion (perform the tests), and make interpretation of the estimated models.