

ECONOMETRICS

Exercises 4:

1. (W 3e, C7.4) Use the data set *gpa2* and estimate model

$$\begin{aligned}\text{colgpa} = & \beta_0 + \beta_1\text{hsize} + \beta_2\text{hsize}^2 + \beta_3\text{hsperc} + \beta_4\text{sat} \\ & + \beta_5\text{female} + \beta_6\text{athlete} + u,\end{aligned}$$

where **colgpa** is cumulative college grade point average, **hsize** is the size of high school graduating class, in hundreds, **hsperc** is academic percentile in graduating class from top, **sat** is combined SAT score, **female** is a binary gender dummy, and **athlete** is a binary variable, which is one for student-athletes.

- a) What are your expectations for the coefficients in this equation? Which ones are you unsure about?
 - b) Estimate the model and report the results.
 - c) Drop **sat** from the model and reestimate the equation. What is the estimated effect of being athlete? Discuss why this estimate is different from that obtained in the original model.
 - d) Does the effect of **sat** on **colgpa** differ by gender? Estimate the relevant model and explain.
 - e) In the original model, allow the effect of being athlete to differ by gender and test the null hypothesis that there is no *ceteris paribus* difference between women athletes and women nonathletes.
2. Download from <http://finance.yahoo.com> monthly price series for Microsoft (MSFT) and SP500 (^GSPC) monthly series from January 1990 to August 2012. Create log-return series $r_t = 100 \log(P_t/P_{t-1})$, where P_t is the dividend-adjusted price of the series at time point t . The data is also available behind this sheet should you have problems downloading them.
 - a) Report sample statistics (mean, standard deviation, skewness, kurtosis, minimum, maximum). Comment the statistics.
 - b) Test whether there is January effect in Microsoft returns and in SP500 returns. That is whether the January return is higher than the returns of the other months. (*Hint* Create a January dummy **january** = (@month = 1) in EViews and estimate the regression $r = \beta_0 + \beta_1\text{january} + u_t$, where r is the return series.)

- c) Create a scatterplot with SP00 returns on the x -axis and Microsoft returns on the y axis. Discuss the scatterplot.
- d) Estimate the market model $r = \alpha + \beta r_m + u_t$, where r is the Microsoft stock return and r_m is the market return proxied by SP500. Discuss the beta of the Microsoft corporation.
- e) Test whether there is a January effect in Microsofts beta. (Note: Take into account the possible January effect in the Microsoft returns.)

Hints for downloading price series from Yahoo:

- Go to the website <http://finance.yahoo.com>.
- Enter the ticker for the price series you want and press 'Get Quotes'.
- Choose historical prices from the left hand pane.
- Select the data range and frequency and press 'Get Prices'.
- Click on 'Download to Spreadsheet' at the bottom of the page.
- Rename the downloaded file to change its type from .csv to .txt.
- Change the decimal symbol in the region and language settings of the control panel from comma to dot.
- Open the text file from Excel and save it.