Economics 102
Problem Set 5 Key
25 points possible

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Instructions: **To receive any credit for this problem set, you must include your command files from GRETL with the file extension *.inp.** When you exit GRETL, it will ask if you want to "Save a record of the commands you executed?" Click "yes" and it will save the commands from that session. Please name the session files using your last name, so, for example "siegler.inp." It is OK to save and attach more than one command file. You must also include a complete World document with all of your regression output, calculations, and written explanations.

This problem set examines the determinants of player salaries in the National Basketball Association.

1. (2 points) Open the GRETL file *nbas2017.gdt*, estimate, and report an ordinary least squares regression with the natural logarithm of player salaries as the dependent variable on a constant and all of the other explanatory variables in the file. Descriptions of the variables are provided below:

   LNSALARY = natural logarithm of each player's annual salary.

   AGE = age of each player in years.

   ALLNBA = binary variable indicating whether the player was named to the All-NBA team the previous season. There are 15 players in total named to the All-NBA team.

   APG = the average number of assists per game. In basketball, an assist occurs when a player passes a ball to a teammate that directly leads to the player scoring a basket (field goal) as a result of the pass. The person who passed the ball is credited with the assist.

   BLACK = a binary variable indicating whether a player is considered black or not.

   TRADED = a binary variable indicating whether a player was traded from one team to another during the previous season or off season.

   BPG = the average number of blocked shots per game. A blocked shot occurs when a defensive player legally deflects a field goal attempt from an offensive player.

   CENTER = a binary variable indicating whether the player plays the center position. In basketball, there are three main positions: center, forward, and guard.

FIRSTROUND = binary variable is the player was drafted in the first round of the NBA Draft. There are 30 first round draft picks each year.

FORWARD = a binary variable indicating whether the player plays the forward position. In basketball, there are three main positions: center, forward, and guard.

GP = the number of games played by a player in the previous season. There are a total of 82 regular season games.

HEIGHT = height of each player in inches.

POST1995_F = to account for a large change in the salary scale in 1995 and after for players drafted in the first round of the NBA draft, a binary variable is included for these players.

PPG = the average number of points per game by each player. A player can score one point by making a free throw, two points by making a basket inside the three-point line, and three points for making a basket beyond the three-point line.

RPG = the average number of rebounds per game by each player. A rebound occurs when a player secures the ball after a missed shot.

SPG = the average number of steals per game by each player. A steal occurs when a player on defense takes the ball away from an offensive player.

AGESQ = the age of each player in years squared (AGE^2).

LNAPI = the natural logarithm of the average annual per capita income (in dollars) in the metropolitan statistical area (MSA) where each team is located.

LNPOP = the natural logarithm of the size of the population in the metropolitan statistical area (MSA) where each team is located.

2. (2 points) The regression in Part 1 is the general unrestricted model. In GRETL, select *Tests/Omitted Variables* and then bubble in the box "Sequential elimination of variables using two-sided p-value" and select 0.10. Report this regression model.

3. (6 points) Compute and interpret the F-statistic ("by hand") testing that the restricted model in Part 2 is the valid restriction of the model in Part 1. Use the 5-percent level of significance. Your test statistic and results should match what GRETL automatically reported in Part 2 above.

4. (6 points) Using the restricted model in Part 2 above, report and interpret the results from a Ramsey Regression Error Specification Test (RESET), White's heteroscedasticity test, and Jarque-Bera normality test. Is the evidence that the restricted regression model in Part 2 is misspecified in any way? Explain.

5. (6 points) Suppose that you are an NBA basketball player with the sole intention of maximizing your salary. Suppose you are dribbling down the court for a layup (for 2 points) and you have the option of passing the ball to a teammate instead (and getting an assist instead of the 2 points). Suppose that your probability of making the layup is the same as your teammate if you pass him the ball. Based on the final restricted model in Part 2, are you better off shooting the ball yourself or passing it to your teammate instead? Be as specific as possible using the coefficient estimates reported in Part 2.

6. (3 points) Precisely interpret the estimated coefficient on "HEIGHT" in the restricted regression from Part 2. What do you think explains the sign, statistical significance, and size of the coefficient on "HEIGHT"? Be as specific as possible.