The University of Kansas

Department of Economics

Quiz 4 **Mar/25/2019**

Econ 526 - Introduction to Econometrics **Instructor: Caio Vigo Pereira**

Name:

SECTION A - MULTIPLE CHOICE

Consider a random sample with the Grade Point Average (GPA) and standardized test scores (ACT), along with the performance in an introductory economics course, for students at a large public university. The variable to be explained is *score*, which is the final score in the course measured as a percentage. The variable *hsgpa* is the high school GPA, *actmth* is the ACT in math and *colgpa* is the college GPA of the student prior to take the economics course.

REGRESSION (A)

```
================================================
                        Dependent variable:
                    ---------------------------
                              log(score)
------------------------------------------------
hsgpa                          0.2120***
                               (0.0199)

Constant                       3.5563***
                               (0.0668)

------------------------------------------------
Observations                      856
R2                               0.1174
Adjusted R2                      0.1163
Residual Std. Error        0.1997 (df = 854)
F Statistic           113.5666*** (df = 1; 854)
================================================
Note:                *p<0.1; **p<0.05; ***p<0.01
```

12.5% 1. Based on the **Regression (A)** above, what is the effect on the dependent variable if *hsgpa* increases one unit?

A. $\widehat{log(score)}$ will increase 21.2%

B. $\widehat{log(score)}$ will increase 0.212%

C. $\widehat{score}$ will increase by 0.212 units

D. $\widehat{score}$ will increase 21.2%

REGRESSION (B)

	Dependent variable:
	log(score)
log(actmth)	0.5084***
	(0.0406)
Constant	2.6735***
	(0.1274)
Observations	814
R2	0.1616
Adjusted R2	0.1606
Residual Std. Error	0.1915 (df = 812)
F Statistic	156.4957*** (df = 1; 812)
Note:	*p<0.1; **p<0.05; ***p<0.01

12.5% 2. Based on the **Regression (B)** above, what is the effect on the dependent variable if *actmth* increases 10%?

A. $\widehat{log(score)}$ will increase 0.5084%
B. $\widehat{log(score)}$ will increase 50.84%
C. $\widehat{score}$ will increase by 5.084 units
D. $\widehat{score}$ will increase 5.084%

REGRESSION (C)

	Dependent variable:
	score
colgpa	14.3155***
	(0.6997)
Constant	32.3061***
	(2.0049)
Observations	856
R2	0.3289
Adjusted R2	0.3281
Residual Std. Error	10.9842 (df = 854)
F Statistic	418.5822*** (df = 1; 854)
Note:	*p<0.1; **p<0.05; ***p<0.01

12.5% 3. Based on the **Regression (C)** above, what is the effect on the dependent variable if *colgpa* decreases 2 units?

A. $\widehat{score}$ will decrease by 28.631 units
B. $\widehat{score}$ will decrease 14.316%
C. $\widehat{score}$ will decrease 28.631%
D. $\widehat{score}$ will decrease by 7.158 units

12.5% 4. The variable *colgpa* is a number from 0 to 4. Consider the case that you would like to transform the college GPA to a scale from 0 to 100. Thus, you create a new variable: *colgpa_scaled*, such that $colgpa\_scaled = 25 \cdot colpga$. Then you rerun the **Regression (C)** replacing *colgpa* by *colgpa_scaled*. What is your new $\hat{\beta}_1$?

A. $25 \cdot 14.3155$

B. $\frac{1}{25} \cdot 14.3155$

C. $\frac{100}{25} \cdot 14.3155$

D. $0.25 \cdot 14.3155$

SECTION B - TRUE OR FALSE

For all models below, assume that you have a random sample, and that (i) $Var(x) \neq 0$ and (ii) $E(u|x) = 0$ for any independent variable x.

10% 1. Consider the following regression model: $log(score) = \beta_0 + \beta_1 colgpa^3 + u$. Then this model is linear in parameters.
◯ True ◯ False

10% 2. Consider the following regression model: $log(score) = \beta_0 + \beta_1 log(colgpa) + u$. Then the OLS is an unbiased estimator for the true β_0 and β_1.
◯ True ◯ False

10% 3. The following regression model: $log(score) = \beta_0 + \beta_1 log(hsgpa) + u$ is also known as constant percentage model.
◯ True ◯ False

10% 4. The following regression model: $log(score) = \beta_0 + \beta_1 colgpa + u$ is also known as constant elasticity model.
◯ True ◯ False

10% 5. In the following regression model: $log(score) = \beta_0 + \beta_1 log(colgpa) + u$, β_1 is the elasticity of *score* with respect to *hsgpa*.
◯ True ◯ False