Special Lecture 2015
Final Quiz, July 13

1. Consider the following models to measure the return to education:

   Model 1: $\ln(wage) = \beta_0 + \beta_1 educ + \beta_2 exper + u$

   Model 2: $\ln(wage) = \beta_0 + \beta_1 educ + \beta_2 exper + \beta_3 female + u$

   Model 3: $\ln(wage) = \beta_0 + \beta_1 educ + \beta_2 exper + \beta_3 female + \beta_4 female*educ + \beta_5 female*exper + u$

   where *wage* is hourly wage, *educ* is years of formal education, *exper* is years of workforce experience, and *female* is a binary variable taking on the value one for female and the value zero for male. Answer the following questions with the table of the estimation results.

   (a) Comparing to Model 1, Model 3 includes female-related factors (*female*, *female*educ*, *female*exper*). State the null hypothesis that these female-related variables have no effect on ln(*wage*). What are *d.f.* and *q* in F statistic for this case?

   (b) Based on question (a), are female-related variables jointly significant?

   (c) The standard error for *female* is missing in the second column. What is the *t* statistic for the coefficient on the variable? Can we conclude that the variable is significant?

   (d) Assume that Model 1 satisfies the Gauss-Markov assumptions. If people with higher educational background tend to have less work experience, can we say that the slope estimate obtained from the simple regression of ln(*wage*) on *educ* is on average higher than 0.161 from the first column of the table?

Dependent Variable: ln(wage)

Variable	1	2	3
educ	0.161	0.140	0.164
	(0.048)	(0.046)	(0.047)
exper	0.018	0.015	0.034
	(0.010)	(0.010)	(0.012)
female		-0.380	0.543
		(?)	(1.535)
female*educ			-0.020
			(0.114)
female*exper			-0.041
			(0.018)
C	-0.464	0.049	-0.613
	(0.688)	(0.709)	(0.753)
R-squared	0.419	0.514	0.652
obs.	20	20	20

standard errors in parentheses

2. Answer the following questions from the textbook.

   (a) Problem 1 & Computer Exercise C3 in Chapter 8.

   (b) Problem 1 & Computer Exercise C1 in Chapter 12.

   (c) Computer Exercise C2 in Chapter 15.

Due day: August 21 (submit your answer sheet attached to email)