Econometric Methods Homework 9

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1 Problem 1

1.1 Table 12.2

	Dependent variable:					Dependent variable:
	log_wage	education	experience	experience2		education
	(1)	(2)	(3)	(4)	(5)	
experience	0.053***	-0.410***				-0.413***
	(0.007)	(0.034)				(0.034)
experience2	-0.219***	0.073				0.093
	(0.034)	(0.165)				(0.165)
black	-0.264***	-1.006***	-1.468***	1.468***	0.282***	-1.006***
	(0.018)	(0.090)	(0.115)	(0.115)	(0.024)	(0.090)
south	-0.143***	-0.291***	-0.460***	0.460***	0.112***	-0.267***
	(0.016)	(0.079)	(0.102)	(0.102)	(0.022)	(0.079)
urban	0.185***	0.404***	0.835***	-0.835***	-0.176***	0.400***
	(0.018)	(0.085)	(0.109)	(0.109)	(0.023)	(0.085)
college	0.045***	0.337***	0.347***	-0.347***	-0.073***	
	(0.017)	(0.083)	(0.107)	(0.107)	(0.022)	
age			1.061***	-0.061	-0.555***	0.430***
			(0.301)	(0.301)	(0.063)	(0.087)
age2			-1.876***	1.876***	1.313***	0.123
			(0.523)	(0.523)	(0.110)	(0.106)

Because the length is exceed in my theme, I paste two figure together.

1.2 Table 12.1

	Dependent variable:				
	log_wage				
	OLS	instrumental variable			
	(1)	(2)	(3)	(4)	(5)
education	0.074***	0.132***	0.133***	0.161***	0.160***
	(0.004)	(0.049)	(0.051)	(0.041)	(0.041)
experience	0.084***	0.107***	0.056**	0.119***	0.047*
	(0.007)	(0.021)	(0.026)	(0.018)	(0.025)
experience2	-0.224***	-0.228***	-0.080	-0.231***	-0.032
	(0.032)	(0.033)	(0.134)	(0.035)	(0.128)
black	-0.190***	-0.131**	-0.103	-0.102**	-0.064
	(0.018)	(0.053)	(0.077)	(0.045)	(0.063)
south	-0.125***	-0.105***	-0.098***	-0.095***	-0.086***
	(0.015)	(0.023)	(0.029)	(0.022)	(0.026)
urban	0.161***	0.131***	0.108**	0.116***	0.083**
	(0.016)	(0.030)	(0.050)	(0.027)	(0.041)
Constant	4.734***	3.753***	4.066***	3.268***	3.748***
	(0.068)	(0.829)	(0.608)	(0.687)	(0.483)
Observations	3,010	3,010	3,010	3,010	3,010
R2	0.291	0.225	0.176	0.145	0.051
Adjusted R2	0.289	0.224	0.175	0.143	0.049
Residual Std. Error (df = 3003)	0.374	0.391	0.403	0.411	0.433
F Statistic	204.932*** (df = 6; 3003)				
Note:					*p<0.1; **p<0.05; ***p<0.01

2 Problem 2

$I_g - Q(Q'Q)^{-1}Q'$ is annihilator matrix (M) of Q
$\because$ M is idempotent and symmetric
$S \xrightarrow{d} Z'MZ = Z'M'MZ = \|MZ\|^2$ & $Z \sim N(0, I_g)$
$\operatorname{rank}(I_g - Q(Q'Q)^{-1}Q') = g-k$
$\therefore S \xrightarrow{d} \chi^2(g-k)$ under H_0 #

GitHub Link

EconometricMethods-homework9-b10901069