ECON 815
Macroeconomic Theory
Winter Term 2012/13

Assignment 4 - ANSWER KEY

1 The Empirics of Growth

(1b) The OLS estimates of the parameters are as follows (*s.e.* in brackets):

$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\sigma}^2$	R^2
-0.266	0.0943	0.194	0.0363
(0.380)	(0.0496)		

Table 1: OLS Estimates - Part 1

(1c) We reject the null at the 6% level. The 95% confidence interval for β_1 is $[-0.0042, 0.1928]$. The speed of convergence is: $\lambda = -\frac{\log\left(1+\widehat{\beta}_1\right)}{T} = -\frac{\log(1+0.0943)}{25} = -0.00360$.

(2b-c) The OLS estimates of the parameters are as follows (*s.e.* in brackets):

Specification	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\beta}_2$	$\widehat{\sigma}^2$	R^2
(OLS)	5.429	1.424	-1.989	0.474	0.6009
	(1.583)	(0.143)	(0.563)		
(RLS)	6.872	1.487		0.474	0.5974
	(0.120)	(0.124)			

Table 2: OLS Estimates - Part 2

(2b) We do not reject the null, because the $F(1, 95)$ statistic is 0.83, with a p-value of 0.3634.
(2d) $\widehat{\alpha} = \frac{\widehat{\beta}_1}{1+\widehat{\beta}_1} = 0.597$.

(3b-c) The OLS estimates of the parameters are as follows (*s.e.* in brackets):

Specification	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\beta}_2$	$\widehat{\beta}_3$	$\widehat{\sigma}^2$	R^2
HK (OLS)	3.830	0.6967	-1.745	0.654	0.257	0.7856
	(1.180)	(0.132)	(0.4159)	(0.0727)		
HK (RLS)	6.514	0.8351		0.635	0.269	0.7738
	(0.099)	(0.120)		(0.073)		

Table 3: OLS Estimates - Part 3

(3d) $\widehat{\alpha} = \frac{\widehat{\beta}_1}{1+\widehat{\beta}_1} = 0.455$; $\widehat{\gamma} = \widehat{\beta}_3\left(1-\widehat{\alpha}\right) = 0.288$.

(4a) The OLS estimates of the parameters are as follows (*s.e.* in brackets):

Specification	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\beta}_2$	$\widehat{\sigma}^2$	R^2
HK (OLS)	6.937	0.993	0.348	0.463	0.6104
	(0.124)	(0.303)	(0.195)		

Table 4: OLS Estimates - Part 4

$\widehat{\alpha} = \frac{\widehat{\beta}_1}{1+\widehat{\beta}_1} = 0.498$, which implies that $\widehat{\rho} = 0.3517$ and $\widehat{\sigma} = 1.542$. We reject the C-D specification at the 8% level, because $\widehat{\rho} \neq 0$, and there is evidence that the production function has an elasticity of substitution which is higher than the Cobb-Douglas case.