Answer Keys for Lab 4

Problem 1

(1) Omitted.

(2) We obtain log(V/L) = -5.09 + 0.90 log(w) – 0.30 developed

(0.31) (0.048) (0.083)

N=16, SSR = 0.20, R2 = 0.95, F = 127.8

(3) t = -0.30/0.083 = -3.6 < -1.77. Hence the null hypothesis is rejected.

Problem 2

(1) We obtain log(income) = 8.49 + 0.097edu – 0.0055 expr – 0.31female – 0.79 rural

(0.061) (0.0037) (0.0012) (0.023) (0.029)

N = 5778, SSR = 3922.2, R2 = 0.47, F = 1274.4

(2) beta3 is negative and statistically significant. Hence there exists discrimination against female, controlling for other factors.

(3) beta4 is also negative and statistically significant. Hence there exists discrimination against rural workers, controlling for other factors.

(4) We add an interaction term female*edu to the regression and obtain,

log(income) = 8.52 + 0.094edu – 0.0055 expr – 0.35female – 0.79 rural + 0.0038 edu*female

(0.070) (0.0049) (0.0012) (0.0537) (0.029) (0.0052)

N = 5778, SSR = 3921.8, R2 = 0.469, F = 1019.6

beta5 is positive, but it is not statistically significant. Hence there is no evidence for the claim.

(5) We add another interaction term female*rural to the above regression and obtain,

log(income) = 8.42 + 0.10edu – 0.0055 expr – 0.14female – 0.71 rural - .0086 edu*female - .18 female*rural

(0.077) (0.0053) (0.0012) (0.088) (0.038) (.007) (0.058)

N = 5778, SSR = 3914.2, R2 = 0.47, F = 853.0

Since beta6 is negative and statistically significant, we find that the female is even more disadvantaged if she holds the rural Hukou.

(6) We add 27 binary variables (prv02-prv28) to the regression in (1) and obtain

	Coef. Est.	S.E.	H.R.S.E.	p-value
beta0	8.0539	0.1684	0.1576	0
beta1	0.0864	0.0034	0.0036	0
beta2	-0.0065	0.0011	0.0012	0
beta3	-0.3281	0.021	0.0212	0
beta4	-0.7343	0.0263	0.0283	0
beta5	1.126	0.1741	0.158	0
beta6	0.5893	0.1718	0.154	0.0006
beta7	0.6449	0.1695	0.1571	0.0001
beta8	0.6848	0.1822	0.1668	0.0002
beta9	0.3791	0.1781	0.1681	0.0334
beta10	0.5536	0.17	0.1571	0.0011

beta11	0.176	0.1841	0.1697	0.3391
beta12	0.3176	0.1762	0.1654	0.0716
beta13	1.2086	0.1722	0.1579	0
beta14	0.7023	0.1674	0.1565	0
beta15	1.0257	0.1751	0.1655	0
beta16	0.3953	0.1677	0.1559	0.0185
beta17	0.7521	0.1713	0.1587	0
beta18	0.2335	0.1792	0.1696	0.1926
beta19	0.687	0.1669	0.1541	0
beta20	0.0042	0.1684	0.1557	0.98
beta21	0.3187	0.1686	0.1558	0.0588
beta22	0.6779	0.1681	0.1542	0.0001
beta23	0.8303	0.1678	0.1578	0
beta24	0.3903	0.1711	0.1614	0.0225
beta25	0.4832	0.1935	0.1823	0.0126
beta26	0.1284	0.1934	0.1836	0.5066
beta27	0.3016	0.1674	0.1553	0.0716
beta28	0.5126	0.1717	0.1584	0.0028
beta29	0.2838	0.1715	0.1595	0.098
beta30	0.1378	0.1719	0.1587	0.4227
beta31	0.2755	0.1734	0.1655	0.1121

N=5778, SSR =3466.6, R2 = 0.53, F = 209.5

F = (3922.2 – 3466.6)/27 / (3466.6/(5778-32)) = 28.0 > 1.49. Hence the null hypothesis of no provincial differences is rejected.

Problem 3

(1) The estimation of the linear probability model yields

lfp = -1.03 + 0.068 wa -0.0009 wa^2 + 0.0357 we + 1.6384e-6 faminc – 0.16 kids

(0.52) (0.025) (0.0003) (0.0079) (1.5662e-6) (0.044)

N = 753, SSR = 173.5, R2= 0.06, F = 9.68

(2) Discussions omitted.

(3) The probability for the woman is: -1.03 + 0.068*60 -0.0009*60^2 + 0.0357*20 + 1.6384e-6*100000 – 0.16*0 = 1.68, a nonsense probability.

(4) Estimating the probit model, we obtain

p=F(-4.16 + 0.19wa – 0.0024wa^2 + 0.098 we + 4.5806e-6 faminc -0.45kids)

(1.40) (0.066) (0.0008) (0.023) (4.2064e-6) (0.13)

The probability of the woman being in labor force is F(-4.16 + 0.19*50 – 0.0024*50^2 + 0.098*20 + 4.5806e-6 *100000 -0.45*0)=96.1%. If she has a kid under 18, the probability becomes 90.5%.

(5) The average age is 42.5, average education is 12.3, average family income is 23081. The marginal effect of education on the average woman's probability of being in labor force is given by 0.098*F(-4.16 + 0.19*42.5 – 0.0024*42.5^2 + 0.098*12.3 + 4.5806e-6 *23081 -0.45*0)=0.0797. That is, the probability increases by 7.97% with additional year of schooling for the average woman, holding other factors fixed.

(6) The marginal effect of age is given by (0.19-2*0.0024*42.5)*F(-4.16 + 0.19*42.5 – 0.0024*42.5^2 + 0.098*12.3 + 4.5806e-6 *23081 -0.45*0)=-0.0114.