

Assignment 4

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$$a) \quad z_i = -1.400 + 0.484 x_{1i} + 1.454 x_{2i} + 2.173 x_{3i} + 1.855 x_{4i} \\ (0.553) \quad (0.169) \quad (0.500) \quad (0.776) \quad (0.714)$$

$$b) \quad \text{prob} - \chi^2 = 0.0000 < 0.05$$

H_0 is rejected.

$\therefore$ At least one of the independent variable is significant.

c)

$$z_i = -1.400 + 0.483 x_{1i} + 1.453 x_{2i} + 2.173 x_{3i} + 1.855 x_{4i} \\ (0.563) \quad (0.154) \quad (0.518) \quad (0.859) \quad (0.714)$$

The 2 results are slightly different.

BHHH replaces the observed negative Hessian Matrix with the outer product of gradient while Newton-Raphson algorithm does not.

BHHH is only valid for log-likelihood functions.

Newton method is to approximate the function at a given location by a multidimensional quadratic function, and use the estimated maximum as the start for the next iteration.

$$d) \quad z_i = -0.773 + 0.359 x_{1i} + 1.1396 x_{2i} \\ (0.277) \quad (0.087) \quad (0.322)$$

$$e) \quad z_i = 0.6158 + 8.179 x_{4i} \\ (0.201) \quad (3.212)$$

$$\text{Prob} > \chi^2 = 0.0000 < 0.05$$

$\therefore H_0$ is rejected.

Hence, Heteroskedasticity exists.