**Econ 301-1 Bilkent University**

**Econometrics Department of Economics**

**Lab Exercise**

The American households tend to travel when they take a vacation. The distance they travel for vacationing is modelled as follows:



where the distance of vacationing is a function of the family income, age of the head of the household, and the number of kids in the family.

1. What are the expected signs for the above coefficients?
2. Estimate the model.
3. Examine the residuals of the above estimation. Try plotting the residuals against age and income. (Choose X-Y graph and scatter diagram) What do you observe? If the same graphs are calculated for squares of the residuals do the results change? What can you say about the form of heteroscedasticity according to these plots?
4. Perform the Park’s test. To do so

Estimate , the test

H0: α1=0 versus Ha: not H0.

1. Perform a set of Glejser tests. To do so

Estimate i.

ii.

iii.

then for each cases test H0: α1=0 versus Ha: not H0.

1. If you conclude that the assumption

is valid in this data set, conduct a Goldfeld-Quant test according to the following formula:

Which will have a F-distribution of () degrees of freedom if the null hypothesis  is correct. (do not forget to sort the data according to income)

(If GQ is >the F-critical then reject the null hypothesis that the error variances are equal across sub-samples)

1. Perform the White ***test***.

Estimate ,

the test Ho:α1= α2=α3=α4=α5=α6=α7=α8=α9=0 versus Ha: Not Ho.

Estimate the model get nR2 compare with the chi-square

1. Perform Koenker-Basett Test.

Estimate , the test

then test H0: α1=0 versus Ha: not H0  by using the t-test.

1. Find the generalized (weighted) least square estimates of the coefficients if

j) Estimate the model with OLS but use White’s ***robust standard errors*** for inferences.