

ECON 301 - Problem Set 1

1.1 Null Hypothesis:  $H_0: \mu = 0$

Alternative Hypothesis :  $H_1: \mu < 0$

1.2 t-statistic =  $(-32.8-0) / (466.4/30) = -2.1097$ , so it's p-value is 0.0179.

If we test for 5% significance level, since  $0.0179 < 0.05$  we reject the null hypothesis

If we test for 1% significance level, since  $0.0179 > 0.01$  we fail to reject null hypothesis.

1.3 Since we only consider the effect of taxation on consumption, we assumed that other determinants that may affect the liquor consumption were constant and unchanged.

2.1 1% increase of distance from garbage incinerator, leads to a 0.312 % increase of the house price. Since garbage incinerator uses waste, householders do not want to live near to it. Therefore, the sign of the estimate is valid.

2.2 Many city authorities locate the garbage incinerators out of side city center due to some health based reasons or to sustain comfort of people. Therefore, distance is correlated by other reasons which means the estimation is not unbiased.

2.3 The price of a house might be affected by its size, possibilities in terms of transportation, its neighborhood, infrastructure and etc. Some the factors such as possibilities of health services or richness of the neighborhood might be correlated with distance from garbage incinerators.

3.1 Average Salary is 865.86 thousand dollars.

Average Tenure is 7.95 years.

3.2 There are 5 CEOs who are in their first year.

Longest tenure is 37 years.

3.3  $\log(\text{salary}) = 6.505498 + 0.0097236 \text{ ceoten} + u$

3.4 One more year of a CEO in the same company increases his/her wage by 0.97%.

4.1 It most probably has a diminishing effect on passing rate. Because after a point, each need for a student to pass the course will be satisfied. Therefore additional expend on student will not change the conditions much.

4.2  $\text{math10} = -69.3411 + 11.16439 \log(\text{expend}) + u$

$n = 408, R^2 = 0.0297$

Since only 2.97 % of the variation in passing rate explained by log of expends, the explanatory power of the model is not that important.

4.3 Spending effect is big on passing rate. 10% increase in expend leads to a 1.116 percentage point increase in passing rate.

5.1 Salary average is 957.9455

IQ average is 101.2824, standard deviation of IQ is 15.05264.

5.2  $\text{salary} = 116.9916 + 8.303064 * \text{IQ} + u$  (Level-Level Model)

15 point increase in IQ leads to \$124.5 ( $8.30 * 15$ ) increase in salary.

$R^2 = 0.095$ , since salary explains the 9.5% of the total variation in salary, it does not explain the most part of the variation.

5.3  $\log(\text{salary}) = 5.886994 + .0088072 * \text{IQ} + u$  (Log-Level Model)

15 point increase in IQ leads to 13.21% ( $100 * 0.0088072 * 15$ ) increase in salary.