

Economic sense.

Civil servants working hours still the same, so their wage didn't drop during the pandemic, however the other group working hours decreased so it makes economical sense that their wage decreased.

3.a) Is there evidence of multicollinearity in the data? How do you know? Explain your answers in detail and state the critical value for hypothesis testing to receive full points.

Rely on rules of thumb at 0.8 and 10, not sign of multicollinearity.

Test all parameter

$$t_{\text{cri}} = \pm 2.056$$

$$n-k = 30 - 4 = 26$$

Find t cal

$$H_0: \beta_1 = 0 \quad t_{\text{cal}}(\beta_1) = \frac{\hat{\beta}_1 - 0}{\text{se}(\hat{\beta}_1)} = \frac{-34.1999 - 0}{15.6763} = -2.1775$$

formula

$$H_1: \beta_1 \neq 0$$

$$H_0: \beta_2 = 0 \quad t_{\text{cal}}(\beta_2) = \frac{1.5386 - 0}{3.0005} = 0.5128$$

$$H_1: \beta_2 \neq 0$$

$$H_0: \beta_3 = 0 \quad t_{\text{cal}}(\beta_3) = \frac{39.152 - 0}{1.1531} = 3.3954$$

$$H_1: \beta_3 \neq 0$$

$$H_0: \beta_4 = 0 \quad t_{\text{cal}}(\beta_4) = \frac{18.8024 - 0}{8.3926} = 2.2338$$

$$H_1: \beta_4 \neq 0 \quad t_{\text{OL}} = \frac{1}{\text{VIP}} = 0.6769 \text{ (high)}$$

reject all null hypothesis, except β_2 , $R^2 = 0.6769$, other parameter are significantly different from zero except β_2 , conclude that multicollinearity is not found here.

points.

3.b) What is the property of BLUE? If there is the multicollinearity problem, is the OLS estimators still retain the property of BLUE? If not, which properties are violated?

- 9b Property of BLUE is best linear unbiased estimator
- low variance
 - unbiased
 - tend towards parameters.

BLUE have no multicollinearity problem.

OLS estimators are unbiased, but unbiasedness causes repeated sampling. However OLS have minimum variance so the OLS estimator is still BLUE.

4.a) Interpret the intercept and slope coefficients.

4.a) B_1 is the intercept, when unemployment equal to zero inflation will equal = 1.01 unit.

B_2 is the slope coefficient, related to unemployment rate, when unemployment rate increase by 1%, the inflation rate will increase by 0.5% on average.

4.a) Interpret the intercept and slope coefficients.

4.b) According to the test statistics given after Table 4.1 below, is there any sufficient evidence to conclude that there is heteroscedasticity problem? Show your work on the hypothesis testing. (Use $\alpha = 0.05$)

4.c) Given your test results in a), do the OLS estimators still retain the properties

H_0 : Homoscedasticity
 H_1 : Heteroscedasticity

White test

$$\hat{u} = \alpha_1 + \alpha_2 \text{chem} + \alpha_3 \text{Unem}^2$$

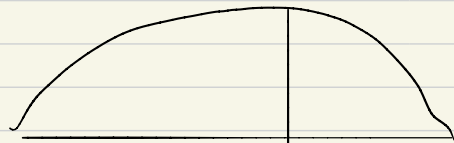
$$LM = n \cdot R^2 = 1.0266$$

$$LM_{cal} < \chi^2$$

Breusch-Pagan

$$LM = n \cdot R^2 = 1.12$$

$K-1$



1.0226 5.995

$$df = 2$$

$$\chi^2 = 5.995$$

$$\alpha 0.05$$

fail to reject the null hypothesis (H_0) / no heteroscedasticity problem.

sufficient evidence to conclude that there is heteroscedasticity problem? Show your work on the hypothesis testing. (Use $\alpha = 0.05$)

4.c) Given your test results in a), do the OLS estimators still retain the property of BLUE? If not, which properties are violated?

Ans We fail to reject null hypothesis, we can make sure that property of BLUE ~~hasn't~~ been violated.