# Homework: 2024/10/9

## 1. Result of each value

Result of $\hat{\beta}_j$

```
[1] "beta_hats:"
          Estimate
ones     0.24602183
x_dfy   -0.81627730
x_infl  -0.25872644
x_svar  -0.19365928
x_tms   -0.24649239
x_tbl   -0.25348610
x_dfr    0.27006370
x_dp     0.05099741
x_ltr    0.13180038
```

Result of $s(\hat{\beta}_j)$

```
[1] "s_beta_hat:"
         Estimate
ones    0.04265661
x_dfy   0.59660216
x_infl  0.63135837
x_svar  0.38033409
x_tms   0.18030425
x_tbl   0.09817880
x_dfr   0.14728129
x_dp    0.00912120
x_ltr   0.07367261
```

Result of $s^W(\hat{\beta}_j)$

```
[1] "s_w_beta_hat:"
          Estimate
ones    0.045786860
x_dfy   0.820993132
x_infl  0.657849477
x_svar  0.810762836
x_tms   0.188770481
x_tbl   0.107648965
x_dfr   0.240869076
x_dp    0.009811133
x_ltr   0.098061658
```

## 2. Result of each t-statistic and hypothesis test

$alpha = 1\ \%$

```
[1] "T test results of each significance level:"
       t_statistic Reject H0 when alpha = 1%
ones     5.7674958                      TRUE
x_dfy    1.3682104                     FALSE
x_infl   0.4097933                     FALSE
x_svar   0.5091820                     FALSE
x_tms    1.3670914                     FALSE
x_tbl    2.5818824                     FALSE
x_dfr    1.8336592                     FALSE
x_dp     5.5910859                      TRUE
x_ltr    1.7890011                     FALSE
```

$alpha = 5\ \%$

```
[1] "T test results of each significance level:"
       t_statistic Reject H0 when alpha = 5%
ones     5.7674958                       TRUE
x_dfy    1.3682104                      FALSE
x_infl   0.4097933                      FALSE
x_svar   0.5091820                      FALSE
x_tms    1.3670914                      FALSE
x_tbl    2.5818824                       TRUE
x_dfr    1.8336592                      FALSE
x_dp     5.5910859                       TRUE
x_ltr    1.7890011                      FALSE
```

$alpha = 10\ \%$

```
[1] "T test results of each significance level:"
       t_statistic Reject H0 when alpha = 10%
ones     5.7674958                        TRUE
x_dfy    1.3682104                       FALSE
x_infl   0.4097933                       FALSE
x_svar   0.5091820                       FALSE
x_tms    1.3670914                       FALSE
x_tbl    2.5818824                        TRUE
x_dfr    1.8336592                        TRUE
x_dp     5.5910859                        TRUE
x_ltr    1.7890011                        TRUE
```

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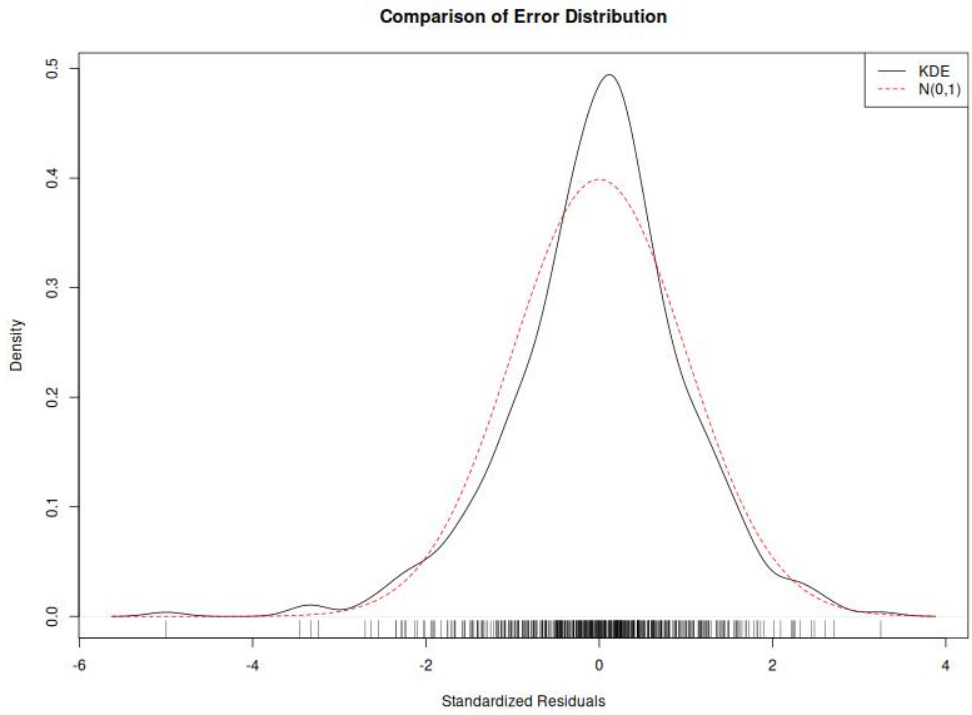
## 3. Result of Jarque-Bera test & Comparison of N(0, 1) and error-term distribution

Result of Jarque-Bera test and hypothesis test

```
[1] "JB statistic:"
[1] 74.89123
[1] "JB test results of each significance level:"
  alpha_levels Reject H0
1         0.01       TRUE
2         0.05       TRUE
3         0.10       TRUE
```

Comparison of N(0, 1) and error-term distribution




The result rejects the null hypothesis of the Jarque-Bera test at the 1% significance level, indicating that the error term is not normally distributed.

According to the skewness = -0.42 and kurtosis = 4.68 of the error term, the error term is more peaked and skewed to the left compared to the normal distribution.

In addition, the skewness and kurtosis of N(0, 1) are 0 and 3, respectively.

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## 4. Source Code

Source Code