

# Quiz 2

ECON312 Time Series Analysis

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Student \_\_\_\_\_  
first name last name

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## Instructions

- The quiz is closed-book.
- No electronic devices are allowed.
- Write your answers in a clear and unambiguous way.

Good luck!

## Question 1 (10 pts.)

We have following results of unit root tests for the following variables:  $W_t$ ,  $Y_t$ ,  $X_t$ ,  $Z_t$ .

$$\begin{array}{ll} \widehat{\Delta W_t} = 0.757 - 0.091W_{t-1} \\ (\tau) \quad \quad \quad (-3.178) \end{array}$$

$$\begin{array}{ll} \widehat{\Delta Y_t} = 0.031 - 0.039Y_{t-1} \\ (\tau) \quad \quad \quad (-1.975) \end{array}$$

$$\begin{array}{ll} \widehat{\Delta X_t} = 0.782 - 0.092X_{t-1} + 0.009t \\ (\tau) \quad \quad \quad (-3.099) \end{array}$$

$$\begin{array}{ll} \widehat{\Delta Z_t} = 0.332 - 0.036Z_{t-1} + 0.005t \\ (\tau) \quad \quad \quad (-1.913) \end{array}$$

1. Write down the Null and Alternative Hypotheses for the Dickey-Fuller tests above. (1 pt)

2. Sketch a graph for the distribution of the test statistic along with the rejection region(s). (1 pt)

3. Which series are stationary, and which are non-stationary at 95% level of confidence? (6 pts)

4. Determine the order of integration for each series. (2 pts)

**Table 12.2** Critical Values for the Dickey–Fuller Test

Model	1%	5%	10%
$\Delta y_t = \gamma y_{t-1} + v_t$	−2.56	−1.94	−1.62
$\Delta y_t = \alpha + \gamma y_{t-1} + v_t$	−3.43	−2.86	−2.57
$\Delta y_t = \alpha + \lambda t + \gamma y_{t-1} + v_t$	−3.96	−3.41	−3.13