# Unemployment Rate, We Do Not Want to Be the Contributor?

Reporter:Chia-Yang Wu

2010/11/30

# Outline

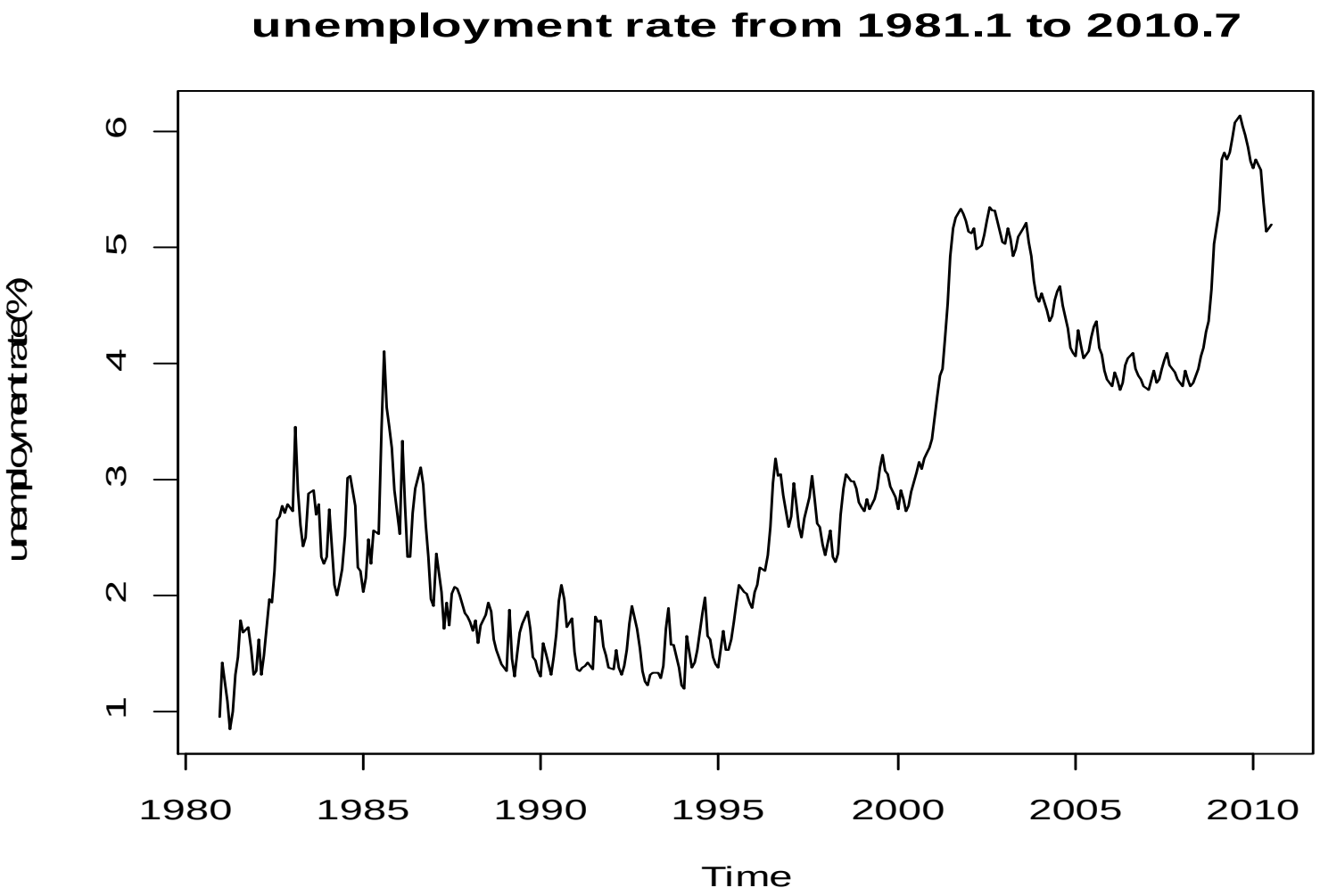
- Motivation
- Data – original data, transformed data
- Proposed method – ARCH, GARCH
- Reference

# Motivation

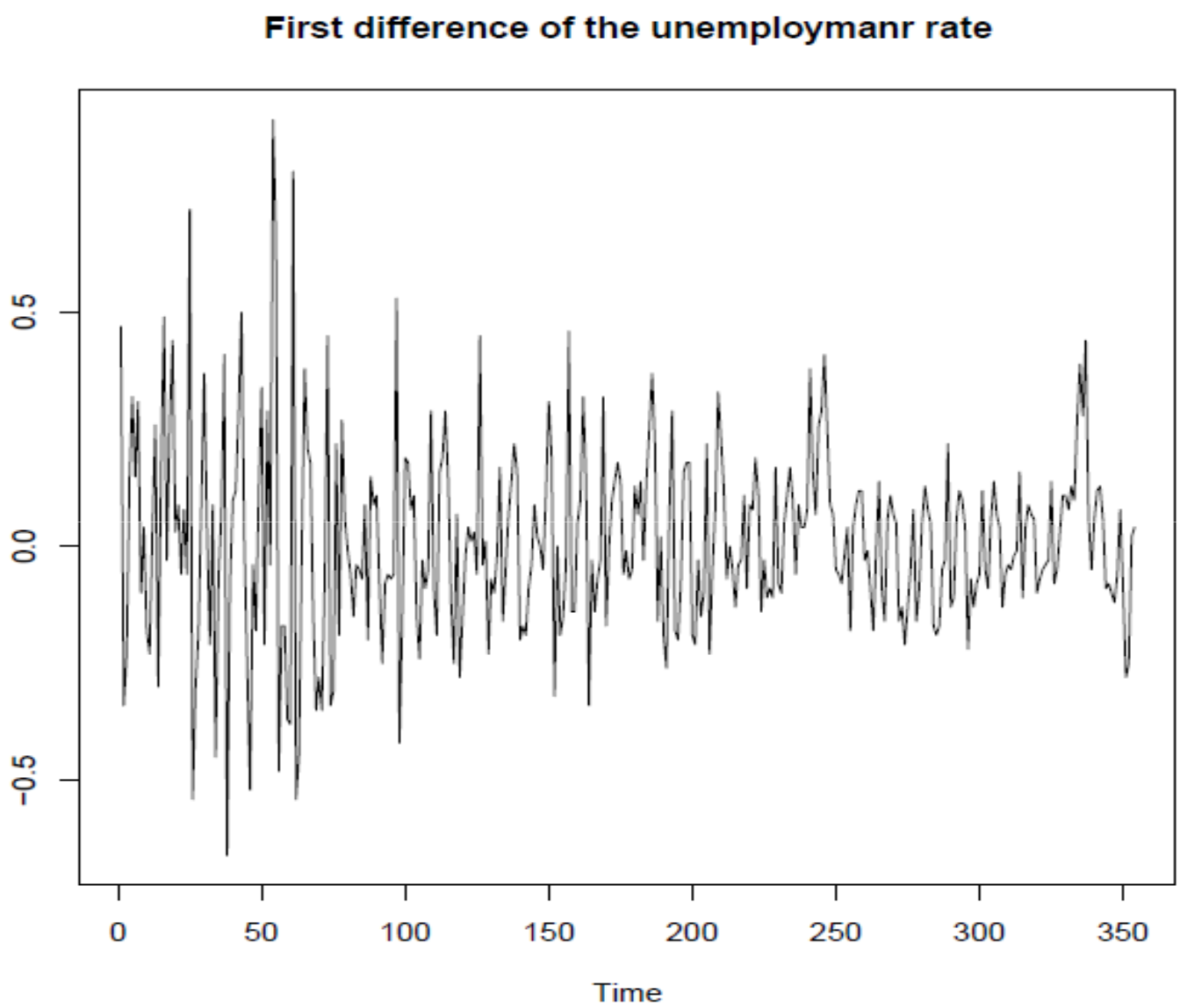
- Our president promised that he will let the unemployment rate decrease to 3%, so I want to understand the trend of the unemployment rate and check the possibility of what he said.

# DATA

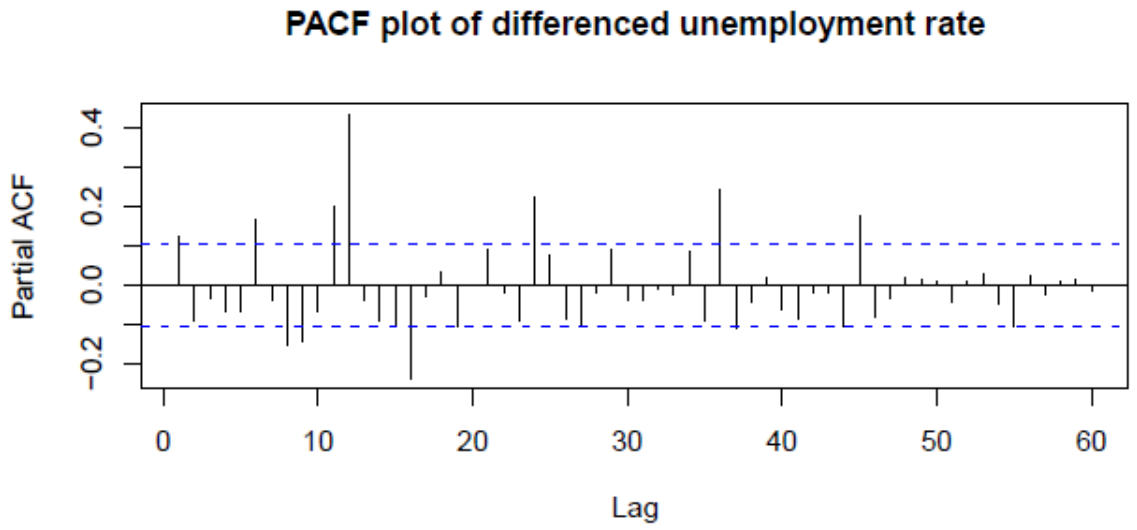
- The data is the monthly unemployment rate of Taiwan from 1981.1 to 2010.7.

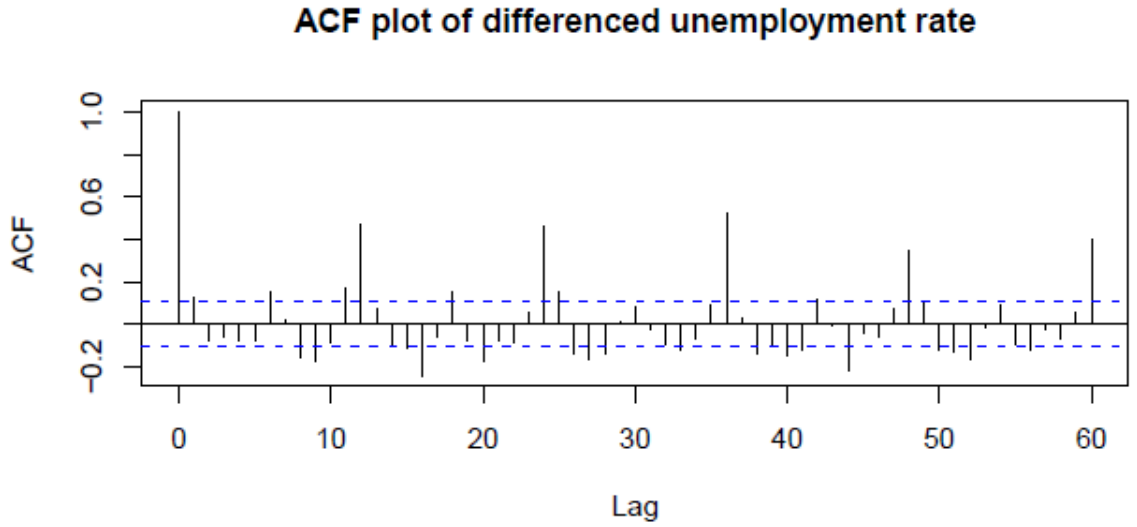


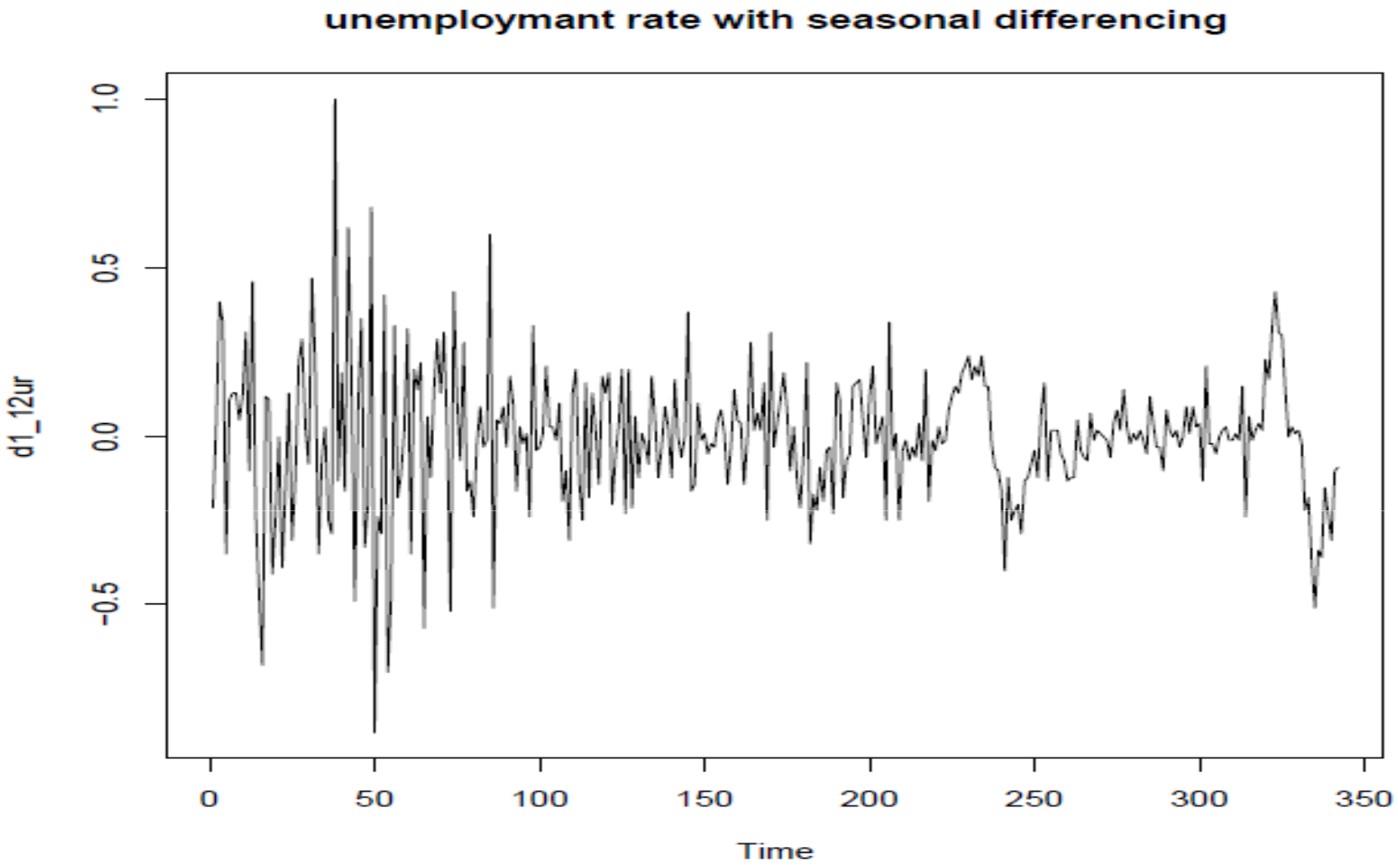

- It seems to have a linear trend.


First difference of the unemploymanr rate
0.5
0.0
−0.5
0
50
100
150
200
250
300
350
Time

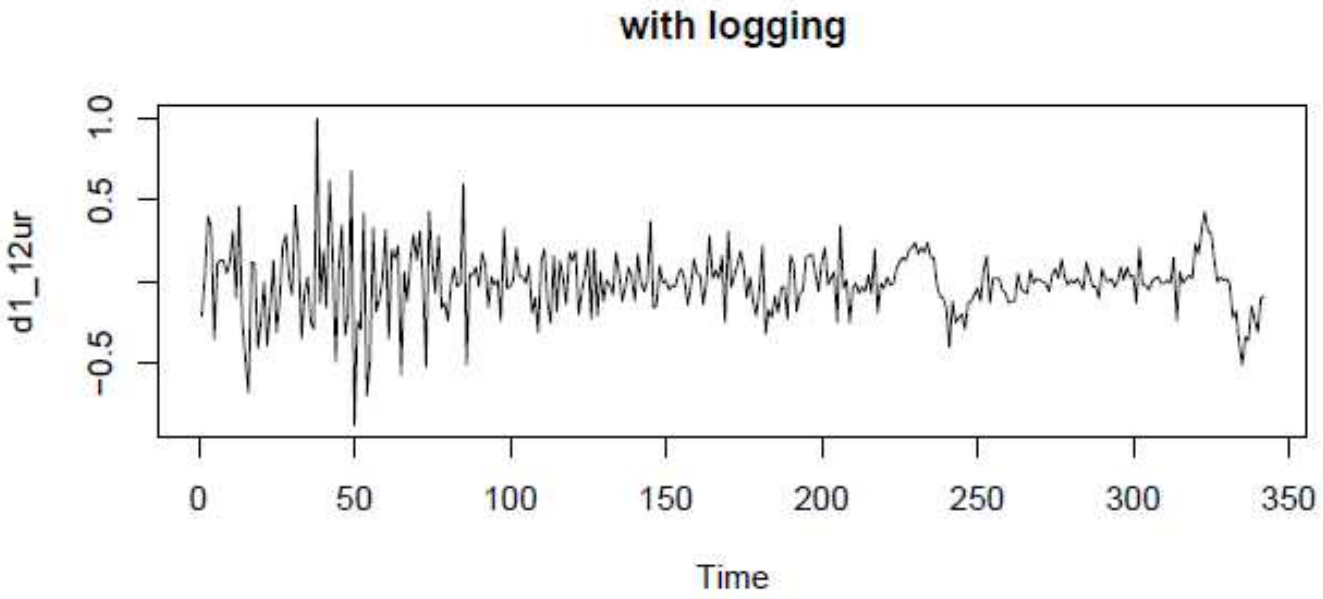
# Check seasonal effect:

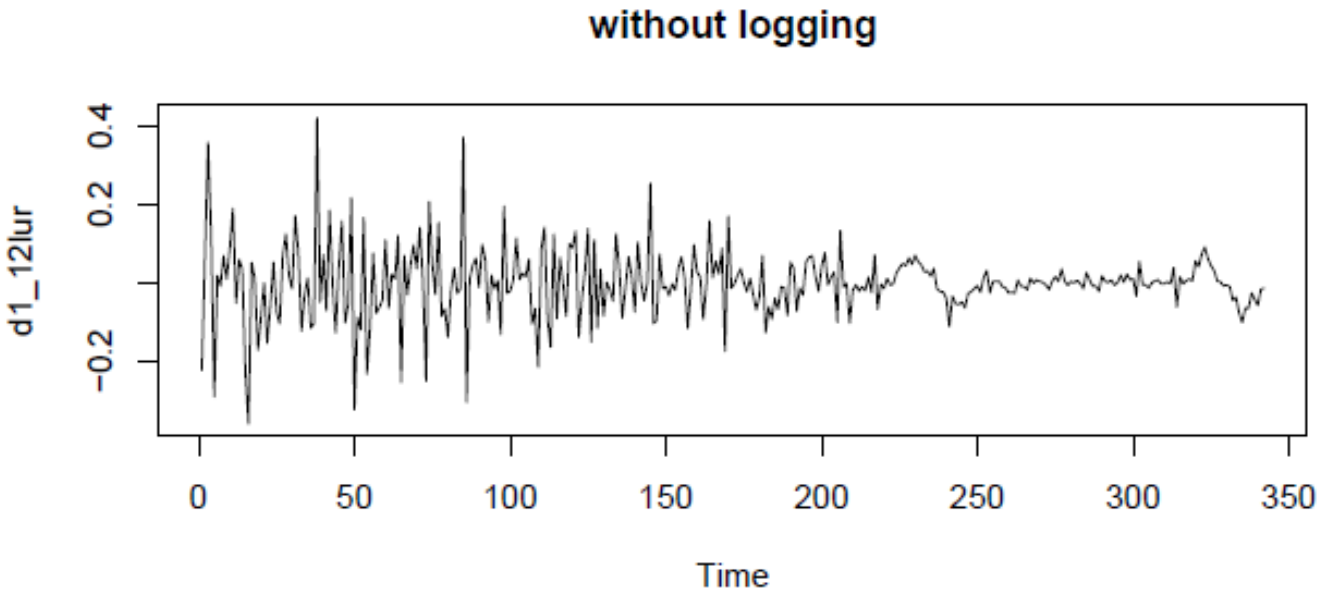





- Unsatisfied variance!


with logging
d1_12ur
1.0
0.5
−0.5
0
50
100
150
200
250
300
350
Time


without logging
d1_12lur
0.4
0.2
−0.2
0
50
100
150
200
250
300
350
Time

# Proposal methods:

- Mean - ARMA(p, q)
- Variance – GARCH(m, r)
  - m: order of lagged squared error
  - r : order of lagged variance

$$y_t \mid \psi_{t-1} \sim N(x_t \beta, h_t)$$

$$\varepsilon_t = y_t - x_t$$

$$h_t = \alpha_0 + \sum_{i=1}^{m} \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^{r} \beta_j h_{t-j}$$

# GARCH(m, r) model:

$$y_t \mid \psi_{t-1} \sim N(x_t \beta, h_t)$$

$$\varepsilon_t = y_t - x_t$$

$$h_t = \alpha_0 + \sum_{i=1}^{m} \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^{r} \beta_j h_{t-j}$$

- $y_t$ : observations
- $\psi_{t-1}$ : the information set before time t
- $x_t$ : explanatory variable
- $h_t$ : conditional variance

# Reference:


- Directorate – General of Budget, Accounting and Statistics, Executive Yuan, R.O.C.(行政院主計處)
- http://www.dgbas.gov.tw/ct.asp?xItem=17144&ctNode=3246