

11.3: Estimating the Regression Model with Autocorrelated Errors and Using it to Make Predictions

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Read Section 14.3 of your textbook. As you read, take notes on the following.

Note: There is a mistake in last line of equation (14.7) in textbook. ε_t should be a_t .

- 1 Using your own words, describe the steps you would take to fit a simple linear regression model with first-order autocorrelated errors using the Cochrane-Orcutt method.
- 2 What is the forecast at time period $T + 1$ based on the end of the current time period T ?
- 3 What is the one-step ahead forecast error?

Watch this video for an example on how to implement the Cochrane-Orcutt method to fit a regression model with AR errors.

SLR with AR(p) Errors

The simple linear regression model with AR(p) errors:

$$y_t = \beta_0 + \beta_1 x_t + \epsilon_t, \tag{1}$$

where

$$\epsilon_t = \phi_1 \epsilon_{t-1} + \phi_2 \epsilon_{t-2} + \cdots + \phi_p \epsilon_{t-p} + a_t, \tag{2}$$

and a_t are i.i.d $N(0, \sigma_a^2)$.

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 module11_method.pdf
Slides to accompany the "Cochrane-Orcutt Method" video