

Economics 618B: Time Series Analysis
State University of New York at Binghamton
Department of Economics
Spring, 2009

Midterm

The exam is worth 100 points. Each question is of equal value.

1. Consider the MA(q) process, with equal weights $1/(q+1)$ at all lags, given by

$$Y_t = \sum_{j=0}^q \varepsilon_{t-j} / (q+1).$$

- (a) Give the mean of this process.
- (b) Give the variance of this process.
- (c) Give the ACF of this process.

2. Consider the AR(1) process

$$Y_t = \phi Y_{t-1} + \varepsilon_t.$$

- (a) Give the h -step ahead forecast for $h = 1, 2, \dots$
- (b) Give the h -step ahead forecast error for $h = 1, 2, \dots$
- (c) Give the variance of the h -step ahead forecast error for $h = 1, 2, \dots$

3. Consider the following MA(2) process

$$Y_t = \varepsilon_t - 1.1\varepsilon_{t-1} + 0.18\varepsilon_{t-2}.$$

- (a) Show that it is covariance-stationary.
- (b) Show that it is invertible.

4. Consider the following model

$$Y_t = Y_{t-12} + \phi(Y_{t-1} - Y_{t-13}) + \varepsilon_t + \theta\varepsilon_{t-12}.$$

- (a) What time series name would you give for this model?
- (b) Give the h -step ahead forecast error for $h = 1, 2$.
- (c) How would you interpret the coefficients 1 (on Y_{t-12}), ϕ and θ ?