

Midterm

Usvyatsov Mikhail

March 31, 2015

1 Part 1

- (a) We know, that the first autocorrelation coefficient ϕ_1 is close to one and so we can write that $y_t = \phi_0 + \phi_1 y_{t-1} + \epsilon_t$. Due to the fact, that ϕ_1 is close to one we can decide, that there is a unit root. So, Canadian inflation rate has a stochastic trend. One of more formal approach to test for the unit root is Augmented DickeyFuller test.
- (b) $H_0 : \theta = 0$
 $ADF = -\frac{0.1}{0.05} = -2$
- (c) We have to accept Null hypothesis in all occasions, because -2 is less negative than all the critical values.
- (d) It is necessary to look on the correlation between lag_i and current value of series. If the correlation is statistically significant - we have to include this lag.
- (e) AR(1):
 $\delta Inf_t = 0.002 - 0.31 * (-1.5) = 0.46$
Inflation rate = $Inf_{t-1} + \delta Inf_t = 1.3 + 0.46 = 1.76$
The error is $1.76 - 2.1 = -0.34$
AR(4):
 $\delta Inf_t = 0.021 - 0.46 (-1.5) - 0.39 (-1.4) - 0.25 (3.5) = 0.382$
Inflation rate = $Inf_{t-1} + \delta Inf_t = 1.3 + 0.382 = 1.682$
The error is $1.682 - 2.1 = -0.418$
ADL(4,1):
 $\delta Inf_t = 1.279 - 0.51 (-1.5) - 0.44 (-1.4) - 0.3 (3.5) - 0.16 (7) = 0.49$
Inflation rate = $Inf_{t-1} + \delta Inf_t = 1.3 + 0.49 = 1.79$
The error is $1.79 - 2.1 = -0.31$
- (f)