

1.5 Exercises 5: Date 7.6.2013

1. Derive the variance of the forecasting error of the constant mean model $y_s = \beta + u_s$.
2. What is the difference between the variance of an individual forecast and the variance of a mean forecast?
3. Use the file **coffee.xls** and compute a point forecast of the average coffee consumption for the years 1981 until 1985 with the following price information:

t	p_t
1981	1.065
1982	1.118
1983	1.131
1984	1.202
1985	1.161

4. Compute the forecast variance for each forecast and produce a (95%) interval forecast for periods 1981 to 1985.
5. Compute three forecast accuracy criteria including Theils U when the realised values for 1981 until 1985 turned out to be 2.2, 2.17, 2.13, 2.1, 2.15.
6. Use the file **cps78.xls** and reestimate the equation

$$LNWAGE_i = \beta_0 + \beta_1 AGE_i + \beta_2 ED_i + \beta_3 FE_i + \beta_4 UNION + u_i$$

Calculate the point and interval forecast for a 33 year old woman with 18 years of education who is a member of the labour union. Hint: Use the estimated coefficient covariance matrix of your regression program.

7. What is the difference between an unconditional and a conditional forecast? How do you estimate a forecast interval for a conditional forecast?
8. In the file **car.xls** you find time series of monthly registrations of new and used cars in Austria. Model one of the series with seasonal indicators and test the residuals for remaining autocorrelation up to 36th order.
9. Transform one of the series in **car.xls** into annual log differences i.e. $\ln(y_t) - \ln(y_{t-12})$ and test if this is a seasonal series.
10. Apply simple exponential smoothing to one of the annual log differenced car series. Choose the smoothing parameter according to the minimum squared one step forecast error.