**AGEC 643**

**Homework 1**

**Due Sept. 16, 2011**

1. Use the data in HWK1.XLSX, worksheet Data 1, and answer the steps below.
2. Calculate the summary statistics
3. Estimate trend regressions
4. Forecast variables for 5 years using trend regression
5. Calculate the correlation matrix for the variables
6. Calculate the covariance matrix for the variables
7. Calculate the square root of the correlation matrix; call it R
8. Transpose the R matrix
9. Calculate the product of RR’, check if it equals the original correlation matrix
10. Sort the original data on column 2 carrying along all the other columns
11. Convert the matrix of data to a column vector
12. Next reverse the steps in j and create a matrix from the column vector
13. Create a diagonal matrix (10 x 10) of 1’s
14. Use the data in HWK1.XLSX, workbook Data 2.
    1. Estimate the multiple regression model using the Simetar function
    2. Estimate the beta coefficients using matrix formulas
    3. Forecast the dependent variable given these X’s:

Year 1 Year 2 Year 3

X1

X2

X3

X4

* 1. Simulate the dependent variables for 3 Years using the Y-hats in step C using the std. dev. of the residuals
  2. Repeat step d using the standard error of prediction, calculated as std. dev. \* Y-hat/ mean.
  3. Report the summary statistics for the 6 simulated variables.
  4. Report the PDF and CDF of the third years value in steps e and f.

1. Develop a simple simulation model to estimate the PDF and CDF of total net returns for a business.

X1 X2 X3

Production

Mean

Std. dev.

Price

Mean

Std. dev.

Variable Cost/Prod Unit

Fixed Cost 1000.0

KOVs:

Calculate total revenue

Calculate total costs

Calculate total net returns

Simulate the model and report summary statistics for all stochastic variables and the KOVs. Present the CDF and PDF for the net returns distribution.