

AGEC 643
Homework 2
Due October 20, 2017 by Noon

Data for this homework is in the AGECE 643 Website in the Data Folder

1. Use the data in HWK2-1.XLSX to simulate the crop prices as a multivariate Normal distribution using the general procedure. Detrend the data prior to estimating the parameters and calculate std dev using the residuals. Show all of your work with VFORMULA().
 - A. Simulate the MVN 500 iterations.
 - B. Print the multivariate validation tests and check correlation.
2. Repeat problem 1 but estimate the parameters and simulate the prices as MVE as percent deviates from \hat{Y} from trend. Use the historical mean prices for the assumed means in the simulation. Show all of your work with VFORMULA(). Show all of your work.
 - A. Simulate the MVE 500 iterations.
 - B. Print the multivariate validation tests and check correlation.
3. Repeat problem 1 but simulate prices as a Clayton copula and simulate the prices assuming their marginal distributions are the normal. Use the deviates from trend for the stochastic variables and to calculate the standard deviations. Use historical means for the probabilistic forecast. Show all of your work.
 - A. Simulate the Copula for 500 iterations.
 - B. Print the validation tests and correlation tests and explain why they did not work.
4. Repeat problem 2 but this time use the trend forecasted prices as the means in the simulation.
5. Use HWK2-2 data and estimate the OLS equation; and simulate it three ways. Use the assumed means for the Xs.
 - Simulate the regression model using the residuals as the stochastic component and the historical means for the Xs.
 - Simulate the regression model using stochastic betas and the error term and the historical means for the Xs.
 - Simulate the regression model using stochastic betas, Xs, and residuals. Assume the Xs are distributed MVEMP as percent deviations from trend and their forecasted means are the trend forecasted values.
 - A. Print the models used for the three simulation problems.
 - B. Print summary statistics for the three simulated KOVs (the 3 stochastic y-hats).
 - C. Print a CDF with all three Y-Hats on one axis.

6. The data to simulate a business with five scenarios for variable costs per unit, fixed costs and prices are provided in HWK 2-3. The variable costs, production and prices are stochastic and distributed as independent normal distributions. Simulate the net returns for the business and rank the net returns using stochastic dominance, stochastic efficiency, CDF chart and Stoplight charts. Use LRAC of zero and URAC as $4/\text{wealth}$ for stochastic dominance and efficiency. Print the following outputs on only two sheets of paper (all graphs on one sheet).
- Model in expected value
 - Stochastic dominance rankings,
 - Stochastic efficiency chart and explanation of scenario preferences
 - StopLight chart using lower target at the 25% quantile and the upper target at the 75% quantile.
 - Summary statistics of net returns for the five scenarios.
 - Explain the risk ranking results for a risk neutral, normal risk averse, and extremely risk averse decision maker in the stochastic efficiency chart, and why the rankings differ from the StopLight (or do they).