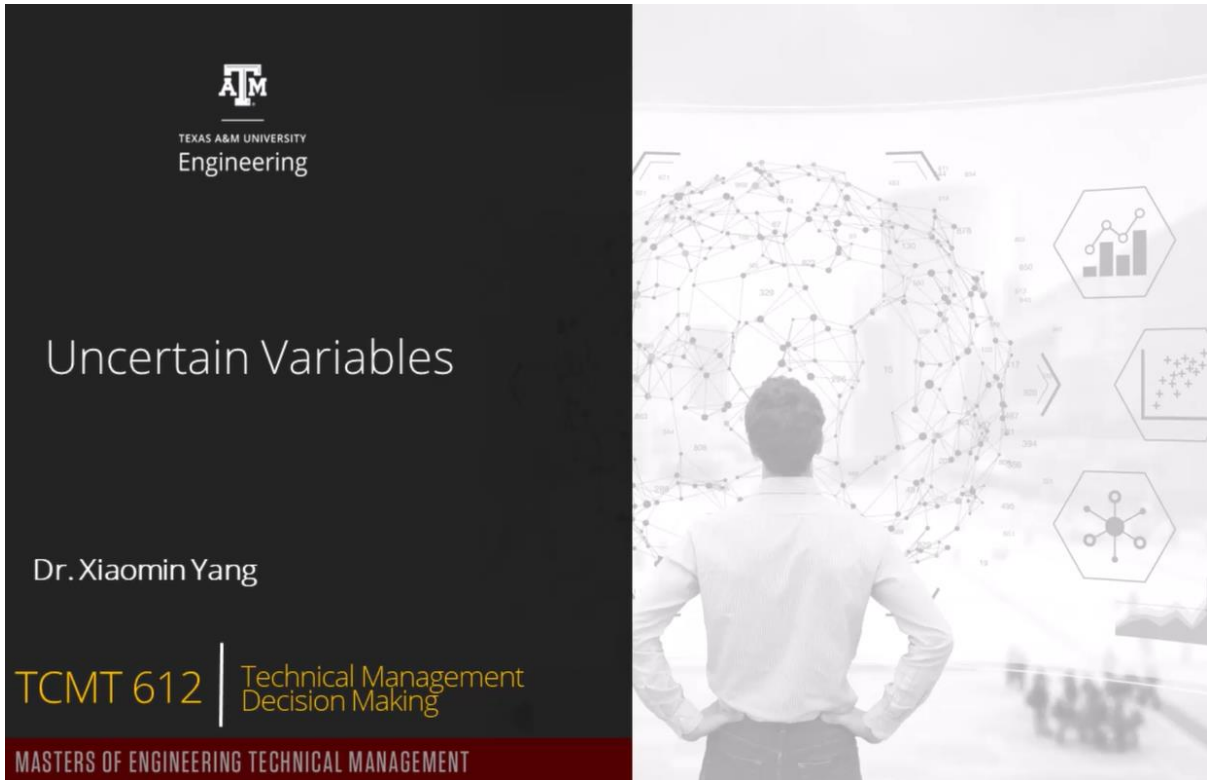


M8L3b. Uncertain Variables

Slide #1



The slide cover is divided into two main sections. The left section is a dark grey rectangle containing the Texas A&M University Engineering logo at the top, followed by the title "Uncertain Variables" in a large, white, sans-serif font. Below the title is the name "Dr. Xiaomin Yang" in a smaller white font. At the bottom of this section, the text "TCMT 612" is displayed in a large, bold, yellow font, followed by "Technical Management Decision Making" in a smaller yellow font. A red horizontal bar at the very bottom of the left section contains the text "MASTERS OF ENGINEERING TECHNICAL MANAGEMENT" in white. The right section of the slide features a background image of a person in a white shirt standing with their back to the camera, looking at a large, complex network diagram. The diagram consists of numerous nodes connected by lines, forming a spherical shape. To the right of the network, there are several hexagonal icons containing different types of data visualizations, including a bar chart, a line graph, and a network diagram.

Now we are going to use Analytic Solver to build a simulation model with uncertain variables.

Slide #2

The screenshot shows the Microsoft Excel interface with the Analytic Solver add-in. The ribbon at the top includes Home, Insert, Draw, Page Layout, Formulas, Data, Review, View, Automate, Analytic Solver, Data Science, and Acrobat. The Analytic Solver tab is active, displaying the Model, Platform, Engine, Output, and Tools sub-tabs. The main worksheet, titled 'Capital Investment Simulation Case Study', contains a detailed financial model. The model includes input cells for uncertain variables (e.g., Sales demand growth, Unit price growth, Material price growth, Fixed cost price growth) and output cells for various financial metrics (e.g., Annual sales demand, Annual delivery, Annual revenue, Total profit). The Analytic Solver pane on the right shows the model structure, including uncertain variables, functions, and reports. The pane is currently showing the 'Simulation' tab, which lists the uncertain variables and functions used in the model. The status bar at the bottom indicates 'Ready' and 'Accessibility: Investigate'.

Open Analytic Solver. Click the Analytic Solver tab in the ribbon.

Define the simulation case for sales demand growth.

Select the cell B8, Simulation Case of Sales Demand Growth.

Click Distributions.

When the Distributions dialog box appears, choose Triangular under Common, then adjust the Parameters option in the next dialog box.

Min: C8. Likely: E8. Max: D8.

Define distributions for other variables.

For the distributions of unit price growth, material price growth, and fixed cost price growth, repeat step 3 for each variable, adjusting the cells accordingly.

Through the output menu under the results icon, we identify the outcome variables, namely incremental profit and ROI.

For profit change, select cell C47.

Go to the results tab in the ribbon.

Choose output and then select in cell.

Repeat the steps above for ROI.

Define simulation outputs.

For mean profit change, select cell C48.

Go to the result tab in the ribbon.

Choose statistics and then select mean.

Enter the cell you'd like to place this statistic, which is C52.

Repeat the above steps for mean ROI, adjusting the cells accordingly.

Define standard deviation outputs.

For standard deviation profit change, select cell C48, go to the result tab in the ribbon, choose statistics, and then select standard deviation.

Enter the cell you'd like to place this statistic, which is D52.

Repeat the above steps for standard deviation ROI, adjusting the cells accordingly.

Run the simulation.

Once all model variables and result displays are configured, run the simulation with 1000 trials.

Choose the simulate tab in the ribbon.

View results.

The resulting probability versus value for each designated outcome variable, profit, and ROI will be illustrated in a bar chart.

By following these steps, you will successfully build and run a simulation model to analyze uncertain market situations using Analytic Solver.