Cell referencing and Sensitivity Analysis

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Achievables

- Cell & 3-D Referencing
- Scenario & Sensitivity Analysis

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Non-Formulae variable on cells

- Do you wish to have a noun beside a number that is not calculated as part of the number? E.g A cell with the entry 12 Mugs, but only 12 is used during calculations

- **Home>>Number>>Format Cells>>Custom Format**
  - *Shortcut* **CNTR** + **1**

- Change General to **0 "Intended Variable"**

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Naming Cells & Ranges

- This is important when you wish to create a name tag to be used later in your formulas.
- You begin by selecting the cell or range of cells you would wish to give a name, then click in the name box, here there will be the cell reference auto-generated by indexing the column and row positions, type in the preferred name then press enter.
- If you have selected a range, you can CNTL+SHIFT+F3 as a shortcut to naming the range
- The name tag given can now be used in formulas to reference the cells or ranges so named

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Cell Referencing

- Cell referencing is useful when working with repetitive formulas.

- **Relative referencing-** The cell formula changes based on relative position of rows and/or columns when copied across multiple cells Cell varies across both rows and columns e.g. **C4**.

- **Absolute reference-** Does not change when copied to another cell. To keep a formula constant holds the referenced cell's row and column constant e.g. **C4**

- **Mixed reference-** Refers to use of absolute column or absolute row in a formula to hold either the row or column constant. If the row is constant while column changes(**C$4**), this requires a mixed reference and vice versa(**$C4**)

- The dollar sign **$** is added before the cell address in the formula. **$** sign is added by pressing **Key F4.**

Exercise

- Create an interactive 10*10 subtraction table that has no negative digit as the output

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3-D Reference

Through 3D Reference, one can perform same action in similarly formatted multiple sheets.

To include heading **Revenue Analysis**, in all cells from Jan to March and in Qtr 1 at the same time;
Click Cell B2 > Click Sheet Jan > press the Shift Key > Click Sheet Qtr 1 > type Revenue Analysis.
The so typed heading should appear in the selected sheets.

To find the **Qtr 1 totals**,
In **Sheet Qtr 1, select Cell C6 and type the SUM Function > Click Sheet Jan > Click the corresponding Cell C6 > Press the Shift Key > Click Sheet Dec** *(Do not select C6 here again as it would lead to circular reference)*> Press Key Enter > Copy down
The resulting formula in Cell C6 is =SUM('Jan :Mar'!C6)

EXCEL BUSINESS TOOLS

2. EXCEL BUSINESS TOOLS

- Sensitivity Analysis
- Goal Seek
- Data Tables

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Learning Objectives

1. Use **PMT** Function to Calculate Payments

2. Use **what if Analysis** tool to Manipulate Variables

3. Use **Conditional Formatting** to Present Results

WHAT IF ANALYSIS

What-If Analysis is an important aspect of planning and managing any business.

Understanding the implications of changes in the factors that influence your business is crucial when it comes to making important business decisions.

WHAT IF ANALYSIS cont.

What would be the effect of an increase in your costs, or if turnover rose or fell by a certain amount?

How would a change in interest rates or exchange rates affect your profits?

Excel offers some easy-to-use tools to save time doing your calculations and help you make more accurate forecasts.

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Choosing a What-If Analysis Tool

Data tables	• To perform several what-if analyses involving one or two input cells and to display analysis in a tabular format • Easily displayed as charts
Create a scenario	• For what-if analyses involving more than two input cells • Scenario summary tables and scenario PivotTables can be used to obtain a quick snapshot of several possible outcomes • Scenarios can be merged and shared among several workbooks
Solver	• To maximize or minimize a value (provide a single solution or "best outcome") • To set a calculated cell to a specific value
Goal Seek	• If you don't need to specify any constraints on your solution

New Perspectives on Microsoft Excel 2010

40

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SCENARIO ANALYSIS

A Scenario is a set of values that Excel saves and can substitute automatically in cells on a worksheet. You can create and save different groups of values on a worksheet and then switch to any of these new scenarios to view different results.

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THREE SCENARIOS

1. Base Case /Normal or Expected Scenario

2. Worst Case/Pessimistic Scenario

3. Best Case / Optimistic Scenario
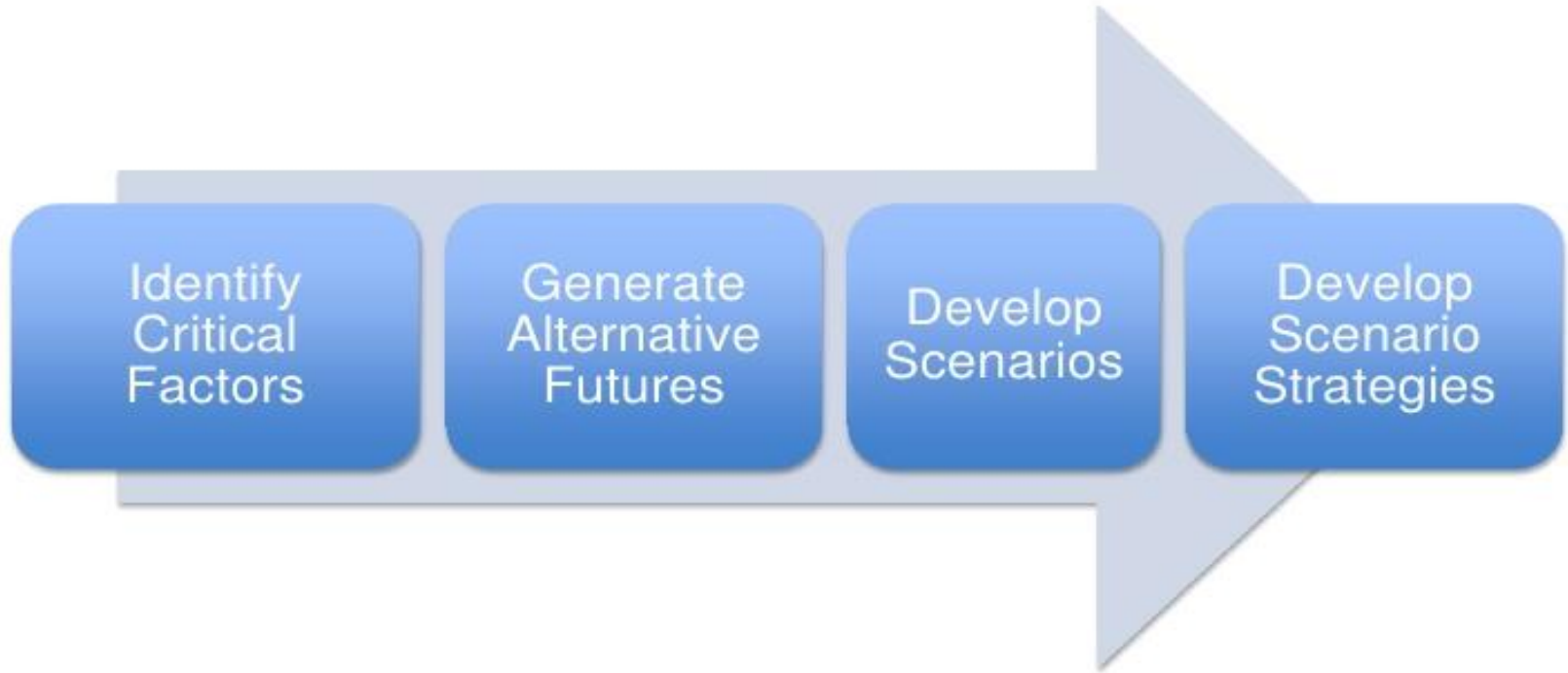
SCENARIO ANALYSIS cont.

For example, suppose you have two budget scenarios: a worst case and a best case. You can use the Scenario Manager to create both scenarios on the same worksheet, and then switch between them. For each scenario, you specify the cells that change and the values to use for that scenario. When you switch between scenarios, the result cell changes to reflect the different changing cell values.

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STEPS

- Have base case: The Initial set of Projections based on projected Cashflow.

- Check alternative Scenario by asking what if Questions.

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Stages to Scenario Analysis

Identify Critical Factors → Generate Alternative Futures → Develop Scenarios → Develop Scenario Strategies

WHY SCENARIO ANALYSIS

Scenario Analysis is useful in telling us:

- ✓ What can Happen
- ✓ How to gauge for Potential for Disaster

Scenario Analysis will not tell us:

- ✓ Whether or not to take up the project or not.

CAUTION!!!!

Note: Scenario reports are not automatically recalculated. If you change the values of a scenario, those changes will not show up in an existing summary report. Instead, you must create a new summary report.

GOAL SEEKER TOOL

The Goal Seek tool allows you to determine what value a particular argument needs to hold so that that a function will return a specified value.

Solver

Advantage Of Goal Seeker

The Goal Seek tool is very useful and saves a lot of "trial and error" when trying to forecast the result of changes to your calculations, but it is limited to changing only one variable at a time.

To see the result of a changing input over a range of values would require you to run Goal Seek many times and record the input values and results for each.

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DATA TABLE

If you have a formula that uses one or two variables, or multiple formulas that all use one common variable, you can use a Data Table to see all the outcomes in one place. Using Data Tables makes it easy to examine a range of possibilities at a glance.

Because you focus on only one or two variables, results are easy to read and share in tabular form. If automatic recalculation is enabled for the workbook, the data in Data Tables immediately recalculates; as a result, you always have fresh data.

Data tables can be used with any calculation that has a variable input.

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COMMUNICATION

CONDITIONAL FORMATTING

The mass of figures in a large data table can make it difficult to read but this can be made a lot easier with the aid of ***Conditional Formatting.***

Unlike regular formatting, conditional formatting can change the appearance of a cell according to the value displayed in it.

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CONDITIONAL FORMATTING SAMPLE

£394.14	36	48	60	72	84	96	108	120	132	144
£ 15,000	£ 461.79	£ 357.80	£ 295.60	£ 254.30	£ 224.93	£ 203.02	£ 186.08	£ 172.62	£ 161.69	£ 152.66
£ 16,000	£ 492.57	£ 381.66	£ 315.31	£ 271.25	£ 239.92	£ 216.55	£ 198.48	£ 184.13	£ 172.47	£ 162.84
£ 17,000	£ 523.36	£ 405.51	£ 335.02	£ 288.20	£ 254.92	£ 230.08	£ 210.89	£ 195.64	£ 183.25	£ 173.02
£ 18,000	£ 554.14	£ 429.36	£ 354.73	£ 305.16	£ 269.91	£ 243.62	£ 223.29	£ 207.14	£ 194.03	£ 183.20
£ 19,000	£ 584.93	£ 453.22	£ 374.43	£ 322.11	£ 284.91	£ 257.15	£ 235.70	£ 218.65	£ 204.81	£ 193.37
£ 20,000	£ 615.71	£ 477.07	£ 394.14	£ 339.06	£ 299.90	£ 270.69	£ 248.10	£ 230.16	£ 215.59	£ 203.55
£ 21,000	£ 646.50	£ 500.92	£ 413.85	£ 356.02	£ 314.90	£ 284.22	£ 260.51	£ 241.67	£ 226.37	£ 213.73
£ 22,000	£ 677.29	£ 524.78	£ 433.55	£ 372.97	£ 329.89	£ 297.76	£ 272.91	£ 253.18	£ 237.15	£ 223.91
£ 23,000	£ 708.07	£ 548.63	£ 453.26	£ 389.92	£ 344.89	£ 311.29	£ 285.32	£ 264.68	£ 247.93	£ 234.08
£ 24,000	£ 738.86	£ 572.49	£ 472.97	£ 406.88	£ 359.88	£ 324.83	£ 297.73	£ 276.19	£ 258.71	£ 244.26
£ 25,000	£ 769.64	£ 596.34	£ 492.67	£ 423.83	£ 374.88	£ 338.36	£ 310.13	£ 287.70	£ 269.49	£ 254.44
£ 26,000	£ 800.43	£ 620.19	£ 512.38	£ 440.78	£ 389.87	£ 351.89	£ 322.54	£ 299.21	£ 280.27	£ 264.62
£ 27,000	£ 831.21	£ 644.05	£ 532.09	£ 457.73	£ 404.87	£ 365.43	£ 334.94	£ 310.72	£ 291.05	£ 274.79
£ 28,000	£ 862.00	£ 667.90	£ 551.80	£ 474.69	£ 419.86	£ 378.96	£ 347.35	£ 322.22	£ 301.83	£ 284.97
£ 29,000	£ 892.79	£ 691.75	£ 571.50	£ 491.64	£ 434.86	£ 392.50	£ 359.75	£ 333.73	£ 312.61	£ 295.15
£ 30,000	£ 923.57	£ 715.61	£ 591.21	£ 508.59	£ 449.85	£ 406.03	£ 372.16	£ 345.24	£ 323.39	£ 305.33

CONDITIONAL FORMATTING SAMPLE

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Thank you