**Presentation Transcript**

1. [**Excel Advanced**](https://image3.slideserve.com/5720792/excel-advanced-l.jpg) Ann Maes & Frederik Gailly Department of Management information Faculty of Economics and Business Administration
2. [**Information**](https://image3.slideserve.com/5720792/information-l.jpg) • Outline, Program, Downloads:http://allserv.ugent.be/~fgailly/ExcelAdvanced • Contact: • Ann Maes (a.maes@ugent.be) • Frederik Gailly (frederik.gailly@ugent.be)
3. [**Outline: Session 1**](https://image3.slideserve.com/5720792/outline-session-1-l.jpg) • Pivot tables and graphs • Data tables • Scenario management • Goal seek • Solver • Importing Financial data from the Web
4. [**Outline: Session 2**](https://image3.slideserve.com/5720792/outline-session-2-l.jpg) • Macro’s • Explore VBA-objects • VBA selection and repetition • VBA buttons and events • VBA form elements
5. [**Pivot Tables**](https://image3.slideserve.com/5720792/pivot-tables-l.jpg) • Transform large amounts of data from a table or database into an organized summary report • Ability to rotate and reorganize the information via “drag-and drop” • Ability to filter and sort data as desired
6. [**Ex. Sales bookstore**](https://image3.slideserve.com/5720792/ex-sales-bookstore-l.jpg) Sales per category, per channel and per year, per trimester?
7. [**Creating a Pivot Table**](https://image3.slideserve.com/5720792/creating-a-pivot-table-l.jpg) • Data > Pivot Table and Pivot Chart Report • Three simple steps: • Step 1: Data Location • Where is the data to analyze? • Pivot table or pivot chart? • Step 2: Data Source • Select range of cells • Select file using Browse • Step 3: Creating the Pivot Table • Location • Layout • Options
8. [**Step 1: Data location**](https://image3.slideserve.com/5720792/step-1-data-location-l.jpg) • The data is in a Microsoft Excel list • We will create a Pivot Table
9. [**Step 2: Data Source**](https://image3.slideserve.com/5720792/step-2-data-source-l.jpg)
10. [**Step 3: Creating the Pivot table**](https://image3.slideserve.com/5720792/step-3-creating-the-pivot-table-l.jpg) • Step 3 • The location will be as a new worksheet • Must now organize Layout
11. [**Layout**](https://image3.slideserve.com/5720792/layout-l.jpg) Field buttons
12. [**Terminology**](https://image3.slideserve.com/5720792/terminology-l.jpg) • Fields are categories of data (these may usually be row or column headings in a table) • Row Fields show each value, or item, in the field as a row • Column Fields show each value as a column heading • Data Area is the main area of the table where comparative values are shown • Grand Totals and Subtotals are sum calculations that appear at the end of relative rows or columns • Page Field is a larger category which can group all of the data in the table
13. [**Pivot table template**](https://image3.slideserve.com/5720792/slide13-l.jpg) Page field: creates a filter for your table Data field: what information do you want to summarize? Column and Row fields: define how data will be displayed in table
14. [**The resulting Pivot Table…**](https://image3.slideserve.com/5720792/the-resulting-pivot-table-l.jpg)
15. [**Pivot table Page Field**](https://image3.slideserve.com/5720792/pivot-table-page-field-l.jpg)• Operates like row and column fields but provides a third dimension to your data • Without necessarily viewing all its values at the same time (filter) • You can also choose to display pivot table pages on separate worksheets
16. [**Page Field**](https://image3.slideserve.com/5720792/page-field-l.jpg)
17. [**Exercise**](https://image3.slideserve.com/5720792/exercise-l.jpg) • Show sales per category and channel for 2002 and 2003 in separate pivot tables • Show sales per category and channel for each trimester of 2003 in separate pivot tables.
18. [**Modifying Pivot Table**](https://image3.slideserve.com/5720792/modifying-pivot-table-l.jpg) • Only selection of values of row/column/ page fields in pivot table ⎝ Drop down list of variable • Change type of calculation (default Sum) ⎝ field settings • More than one data-variable in pivot table • Grouping data ⎝ Group and show detail > Group
19. [**Calculated Fields**](https://image3.slideserve.com/5720792/calculated-fields-l.jpg) • Pivot Table Toolbar > Pivot Table > Formulas > Calculated Field to create a new field • Ex: Commission
20. [**Pivot Charts**](https://image3.slideserve.com/5720792/pivot-charts-l.jpg) • Pivot Table Toolbar > Pivot Charts icon • Chart is created from Pivot Table instead of initial data table • Data > Pivot Table and Pivot Chart Report • Step 1: Pivot Chart • Pivot Chart created from data table • Pivot Chart has same filtering options as Pivot Table
21. [**Template Pivot Chart**](https://image3.slideserve.com/5720792/template-pivot-chart-l.jpg)
22. [**Ex. Show sold units per channel and per year**](https://image3.slideserve.com/5720792/ex-show-sold-units-per-channel-and-per-year-l.jpg) ! If you edit your PivotChart, changes will be made to Pivot Table and vice versa!!
23. [**What-if analysis**](https://image3.slideserve.com/5720792/what-if-analysis-l.jpg) “Allows you to change certain conditions in your worksheet to see how these changes affect the result of various spreadsheet calculations” • a One and Two-Input Data table • Scenario Manager (scenario summary) • Goal Seek • Utilize Solver
24. [**Sensitivity Analysis: Data Table**](https://image3.slideserve.com/5720792/sensitivity-analysis-data-table-l.jpg) • To track how small changes in inputs affect the results of formulas in your model that are dependent on those inputs. • Two varieties: one-variable data table two-variable data table
25. [**One-Way Data Table**](https://image3.slideserve.com/5720792/one-way-data-table-l.jpg) One or more formula List of values for input variable Data Table Matrix with values
26. [**One-Way Data Table**](https://image3.slideserve.com/5720792/one-way-data-table1-l.jpg) • Enter references to formulas to compute across the top (or side) • Enter input data, • Select the cells comprising the table and use Data | Table… • Specify which input value is varied
27. [**Example**](https://image3.slideserve.com/5720792/example-l.jpg) • Calculate the monthly payment for a loan of 12400 EUR of 4 years when you consider a constant interest rate of 11% • What would the monthly payment be when the interest rate varies (10%; 10,5%; 11%; 11,5%; 12%;12,5%;13)
28. [**Result…**](https://image3.slideserve.com/5720792/result-l.jpg)
29. [**What if…**](https://image3.slideserve.com/5720792/what-if-l.jpg) Not only uncertainty about interest rate but also about amount to loan. • Calculate monthly payment for loan at different interest rates en for several amounts (10000, 11000, 12000, 13000, 14000) • Two-way data table
30. [**Two-Way Data Table**](https://image3.slideserve.com/5720792/two-way-data-table-l.jpg) List of values for other input variable Formula or reference to formula List of values for input variable Data Table Matrix with values
31. [**Two-Way Data Table**](https://image3.slideserve.com/5720792/two-way-data-table1-l.jpg) • Enter reference to formula in top left-hand corner of table • Enter values for input data, in left column and top row • Select cells in table, and use Data | Table… • Specify which input values are specified in the table
32. [**Two-way data table**](https://image3.slideserve.com/5720792/two-way-data-table2-l.jpg)
33. [**Scenario management**](https://image3.slideserve.com/5720792/slide33-l.jpg) • To perform what-if analyses with more than two input variables ⎝ use scenarios, which are: • A set of values for multiple cells that Excel can put into a worksheet • Created based on existing spreadsheets in Excel • Use the Scenario Manager to set up and view different scenarios. • As you view each scenario, Excel uses the values in the scenario as input to calculate the results.
34. [**Ex. Scenario Management**](https://image3.slideserve.com/5720792/ex-scenario-management-l.jpg)
35. [**Scenario Management: define several scenarios**](https://image3.slideserve.com/5720792/slide35-l.jpg) Use Tools > Scenarios … menu optionAdd scenarios (with Add… button)
36. [**Adding additional Scenarios**](https://image3.slideserve.com/5720792/adding-additional-scenarios-l.jpg)
37. [**View and edit scenarios**](https://image3.slideserve.com/5720792/slide37-l.jpg) • Scenarios defined⎝ you can view one by selecting the name of the scenario you want to see in the Scenario Manager dialog box and click Show and then Close. • Excel will display the original spreadsheet, with the values from the scenario you chose. • You can edit your scenarios from the Scenario Manager • Select the scenario you want to edit, and click Edit • This will bring up a dialog box in which you can change any of the input values • You can then display the spreadsheet with the values from the edited scenario
38. [**Scenario summary report**](https://image3.slideserve.com/5720792/slide38-l.jpg) • display a summary of the results from all of the scenarios you have created.
39. [**Scenario Summary Report**](https://image3.slideserve.com/5720792/slide39-l.jpg) The Scenario Summary report shows you how your performance measure and your decision varyfor scenarios where multiple input variables are changing.
40. [**What If vs If What**](https://image3.slideserve.com/5720792/slide40-l.jpg) • Data Table and Scenario Analysis asked the question “WHAT IF …” ? • We might also want to ask the question “IF … WHAT” ? • IF our profit is to be $100, WHAT must our sales be?For this question, we can use Goal Seeking • IF our profit is to be maximized, WHAT must be done?For this question, which is more complex, we can use Solver
41. [**Goal seeking**](https://image3.slideserve.com/5720792/goal-seeking-l.jpg) • Use this when you want to find a specific result for a cell by adjusting the value of one other input cell. • Use Tools > Goal Seek… • Under Tools > Options… > Calculations you can change the maximum iterations, the precision, etc. • At the end you can either ignore or accept the solution Excel suggests.
42. [**Example Car Payment**](https://image3.slideserve.com/5720792/example-car-payment-l.jpg)
43. [**Tools > Goal Seek**](https://image3.slideserve.com/5720792/slide43-l.jpg) If the monthly payment may not exceed 200 what should the duration of the loan be…. Output cell address Target level sought Input to vary
44. [**Result…**](https://image3.slideserve.com/5720792/result1-l.jpg)
45. [**Optimization Analysis: Solver**](https://image3.slideserve.com/5720792/slide45-l.jpg) • Finds set of decision variables that achieves best possible value of an output • Answers questions such as: • How should we allocate our budget to maximize profit? • How much inventory should we stock of each type of product, given constraints on shelf size and budget?
46. [**Excel Solver**](https://image3.slideserve.com/5720792/excel-solver-l.jpg) • to solve a mathematical model which has been entered into an Excel spreadsheet • This mathematical model can be either • Linear Programming problem = there is a linear relationship among all constraints and the objectivefunction • Integer Programming problem = decisionvariables can only take integer values in a given range (these integer values can also be boolean = 0 or 1 only)
47. [**The Mathematical Model**](https://image3.slideserve.com/5720792/the-mathematical-model-l.jpg) • Decision Variables = variables assigned to a quantity or response that must be determined in the problem • Objective Function = equation which states the goal of the model • Maximize • Minimize • Constraints = equations which state limitations of the problem • To solve the model, each constraint must be considered simultaneously in conjunction with the objectivefunction
48. [**Tools > Solver**](https://image3.slideserve.com/5720792/tools-solver-l.jpg)
49. [**The Solver Steps**](https://image3.slideserve.com/5720792/the-solver-steps-l.jpg) • Step 1: Read and Interpret the Problem • Step 1.1: determine the decision variables • Step 1.2: state the objective function • Step 1.3: state any constraints • Step 2: Prepare the Spreadsheet • Step 2.1: Enter the decision variables • Step 2.2: Enter the constraints • Step 2. 3: Enter the objective function • Step 3: Solve the model with the Solver • Step 3.1: Set the Target Cell and choose Min or Max • Step 3.2: Select Changing Cells • Step 3.3: Add Constraints • Step 3.4: Set SolverOptions • Step 3.5: Solve and review Results
50. [**Ex. Capital Budgeting**](https://image3.slideserve.com/5720792/ex-capital-budgeting-l.jpg) • A company has six different opportunities to invest money. Each opportunity requires a certain investment over a period of 6 years or less. The Company wants to invest in those opportunities that maximize the combined Net Present Value (NPV). It also has an investment budget that has to be met for each year. In each year there is only a limited amount of money available. All amounts are give in millions of dollars. Interest rate is 5%.