Chapter 22

PivotTable

Of all the techniques that Excel offers for data analysis, PivotTables are the most exciting; the variety of options for data analysis is huge, and the results are immediate.

A PivotTable can sort, filter, create dynamic subtotals by dragging the mouse, add calculated formulas, create a chart that is automatically linked to various dynamic data, and more.

The data for creating a PivotTable can come from a variety of sources, including data organized in an open or closed workbook sheet, a number of tables in sheets in different workbooks, and data drawn from external systems.

With a PivotTable, you can create multiple queries, subtotals that are grouped according to daily totals, totals by days of the week, months, quarters or years, add calculated formulas, and more.

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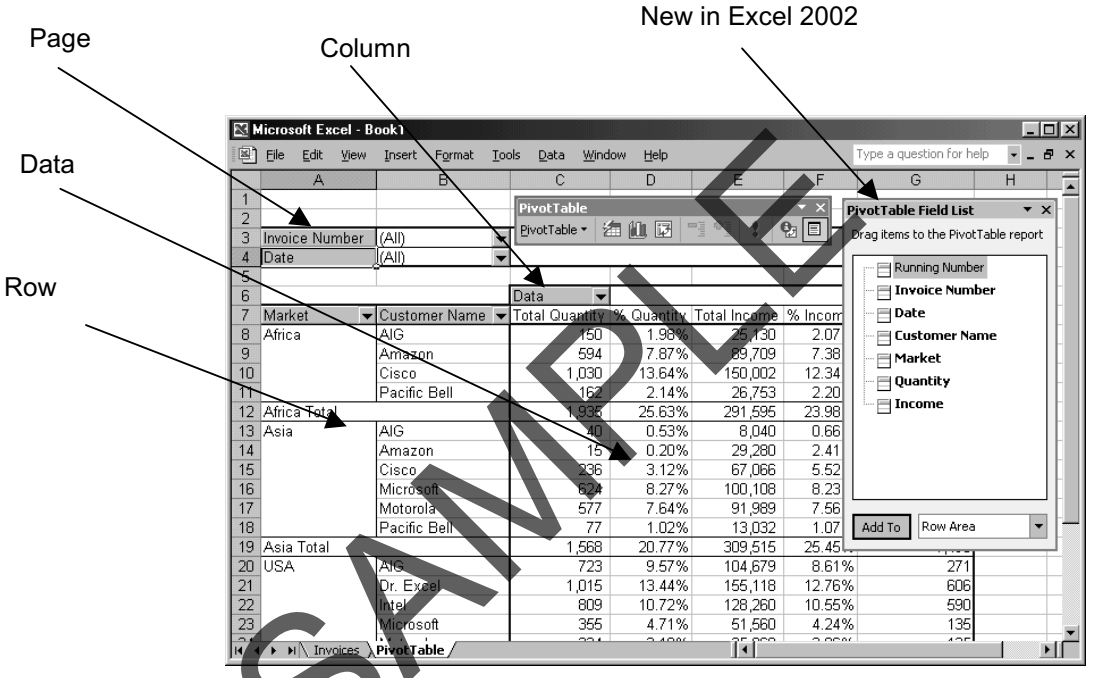
Basic Concepts: Terminology Used in PivotTables

- **Field** – the text at the top of a column in a data table is called a **Field**.
- **Item** – numeric data or text in the **Field** column.
- **Data** – area detailing the data in the lower part of the PivotTable, including columns with numeric data.
- **Row Field** – a **Field** that is positioned as a row in the lower left of the PivotTable.

- **Column Field** – a **Field** that is positioned as a column in the row above the data in the PivotTable.
- **Page Field** – a **Field** that is positioned in the upper left of the Pivot Table.



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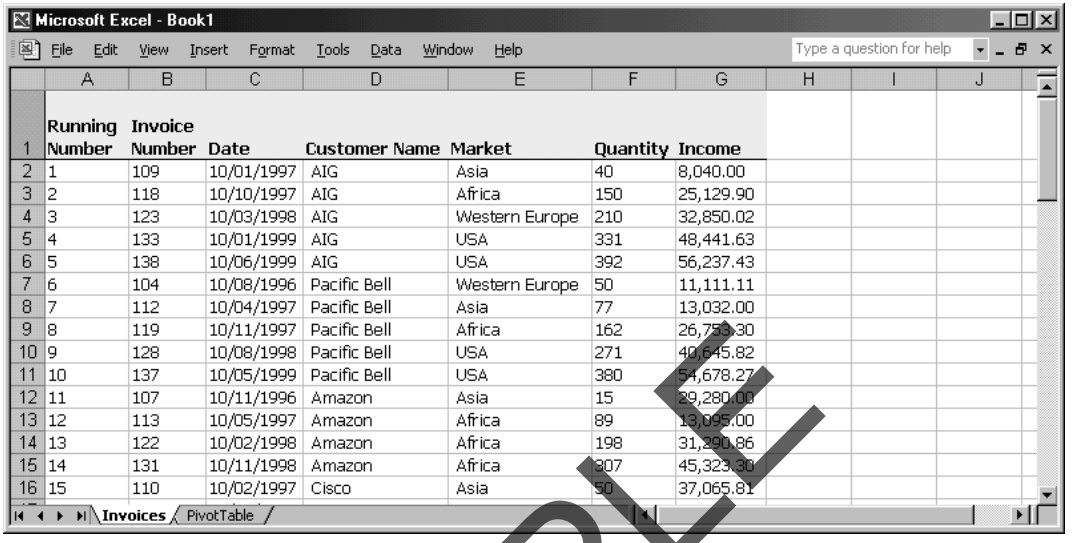
Creating a PivotTable

Rules for organizing data to create a PivotTable

- The data table can have only one header row.
- All the cells in the header row must contain text; the text must be unique.
- The table cannot have subtotal rows, empty rows or columns, or totals.



Running Number	Invoice Number	Date	Customer Name	Market	Quantity	Income
1	109	10/01/1997	AIG	Asia	40	8,040.00
2	118	10/10/1997	AIG	Africa	150	25,129.90
3	123	10/03/1998	AIG	Western Europe	210	32,850.02
4	133	10/01/1999	AIG	USA	331	48,441.63
5	138	10/06/1999	AIG	USA	392	56,237.43
6	104	10/08/1996	Pacific Bell	Western Europe	50	11,111.11
7	112	10/04/1997	Pacific Bell	Asia	77	13,032.00
8	119	10/11/1997	Pacific Bell	Africa	162	26,753.30
9	128	10/08/1998	Pacific Bell	USA	271	40,645.82
10	137	10/05/1999	Pacific Bell	USA	380	54,678.27
11	107	10/11/1996	Amazon	Asia	15	29,280.00
12	113	10/05/1997	Amazon	Africa	89	13,095.00
13	122	10/02/1998	Amazon	Africa	198	31,290.86
14	131	10/11/1998	Amazon	Africa	307	45,323.30
15	110	10/02/1997	Cisco	Asia	50	37,065.81

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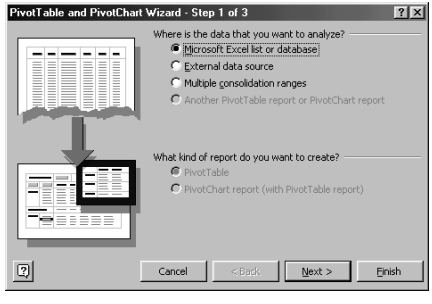
Defining a name for the data table

1. Select the data table from the sheet.
2. Select a cell in the data area and press **Ctrl+***.
3. Press **Ctrl+F3** (the **Define Name** window).
4. Type the text in the **Names in Workbook** box. For example, the name **Data** is defined.
5. Click **OK**.

Steps 1 and 2

6. Select Cell A1 from another sheet in the workbook.
7. From the **Data** menu, select **PivotTable and PivotChart Report**.
8. In **Step 1 of 3**, select **Microsoft Excel list or database**.



9. Click **Next**.
10. In **Step 2 of 3**, select the **Range** box.
11. Press **F3** (**Paste Name** window)
12. Paste the name **Data**.
13. Click **OK**.
14. Click **Next**.

Caution

Did you have a problem continuing to Step 3? Cancel the PivotTable, return to the data sheet and check that the text in each cell in the header row is different than the text in the other cells. Do not leave an empty cell without a header.

Data table in another workbook, open or closed

In the example, you created the PivotTable in the workbook in which the data table is located. If you want to create a PivotTable from a data table located in another workbook, open or closed, define a **Name** for the data table in the open or closed workbook, before beginning to construct the PivotTable.

In the explanation above, the work steps from Step 11 change (**Paste the Name** of the data table).

Data table in an open workbook

1. Select the **Range** box.
2. From the **Window** menu, select the open workbook.
3. Select one of the sheets.
4. Type the **Name** that you defined for the data table, followed by an exclamation point. Click **OK**.

Data table in a closed workbook

1. Select the **Range** box.

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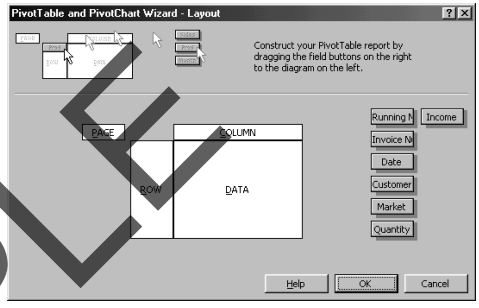
2. Click **Browse**, and select the workbook after locating it in the directory on the hard disk.

3. Type the **Name** that you defined for the data table, followed by an exclamation point. Click **OK**.

Step 3

Click **Layout** (Excel 97 does not include this button).



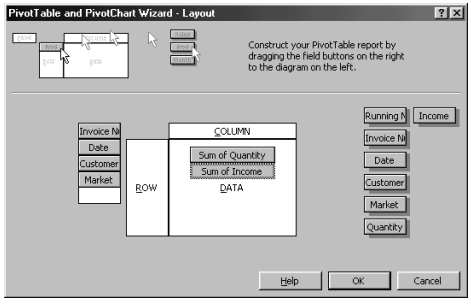
Construct the PivotTable by dragging fields to **Data** and **Page**.

There are three types of PivotTable fields:

1. Data fields.
2. Query/Data filter fields.
3. Fields not relevant to the PivotTable.

For example:

1. Data fields – **Quantity, Income**.
2. Query/Data filter fields – **Date, Invoice Number, Market, Customer**.
3. Fields not relevant to the PivotTable – **VAT, Included VAT**.



Transfer the data fields to **Data**. Click and drag the **Quantity** field to the white **Data** area. Click and drag the **Income** field to the white **Data** area. Transfer query/data filter fields to **Page** – click and drag the **Invoice Number** field to the white **Page** rectangle. Repeat this action to drag the fields **Date**, **Market** and **Customer**.

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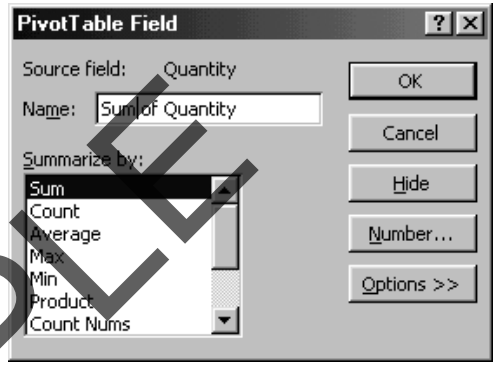
Formatting data fields in a PivotTable

Format each data field separately. You can format or change the formatting later on by clicking the **Field Settings (PivotTable Field in Excel 97)** icon on the **PivotTable** toolbar.

Format the Total Data column – the SUM function



1. Double-click the field **Sum of Quantity**. **Source Field** – the name of the source field – **Quantity**. Excel uses the header text at the top of the column as the **Source Field** Name. In the **Name** box, the text **Sum of Quantity** points to the **SUM** function, according to which the field items are summed. Change the text in the box to something else. For example – **Quantities**. You cannot use the Source Field name **Quantity**.
2. Click **Number**.
3. Click **OK** twice.
4. Repeat steps 1-5 to format the **Income** field.
5. Click **OK**.
6. In the **Step 3** window, click **Finish** (in Excel 97, go to Step 4 and click **Finish**).

The PivotTable toolbar is not displayed

Select any toolbar in the toolbar area, right-click, and from the toolbar shortcut menu, select **PivotTable**.

Notice the figure of the PivotTable. The query fields are in the upper left, and the itemized data fields are in the lower section of the PivotTable.

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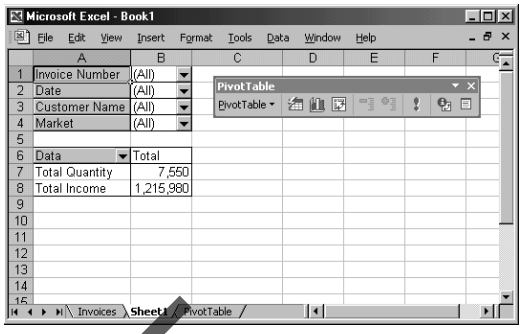
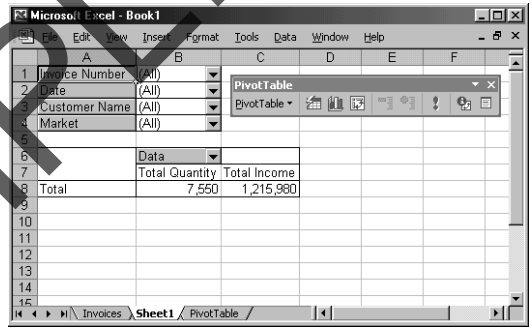
The **Quantities** and **Income** data fields are displayed as rows. Change the direction of the data displayed in the PivotTable from rows to columns. Simply click and drag the data field (in the figure, the field is called Data) to the left, and release the mouse.



(The field list in the figure is new in Excel 2002).

The result –



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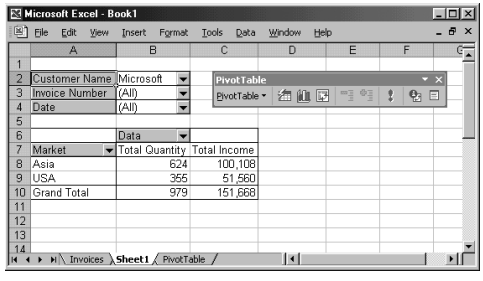
Regular Work with the PivotTable

Filtering and inserting a query into the PivotTable

Place the cursor in the upper left of the **Fields** sheet and select an item in one of the fields (open the list of items by clicking the arrow in the box of one of the fields). This action filters the data in the PivotTable. The results of

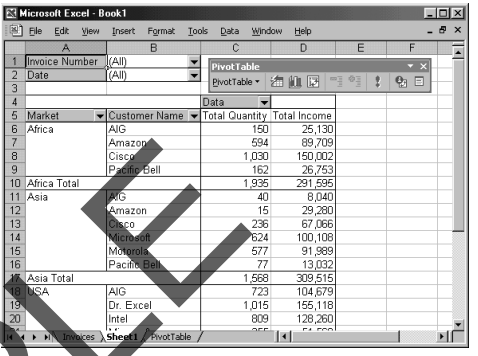


the filter are displayed in the lower section of the PivotTable.

Inserting a complex query

Example:

Click and drag the **Market** field from **Page** to **Row**. Notice the figure – the **Market** field is located to the left of the **Customer Name** field and there is a subtotal below all the items in the **Market** field. Insert an additional query by selecting an item in the **Page** field (in the upper left of the PivotTable).



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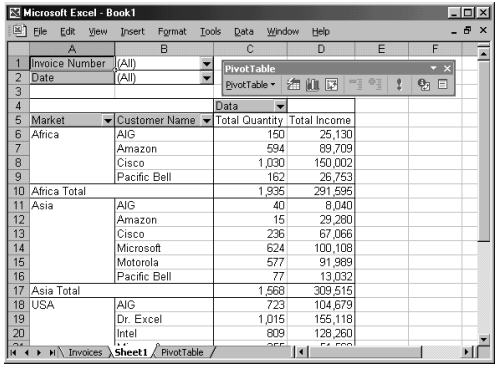
Caution

Dragging a field's button outside of the PivotTable area in the sheet cancels it. If you drag the button outside the PivotTable area, an X sign appears. If you release the mouse at this point, the field is deleted. To cancel this action and return the deleted field to the PivotTable, press **Ctrl+Z**, or click the **Undo** icon on the toolbar.

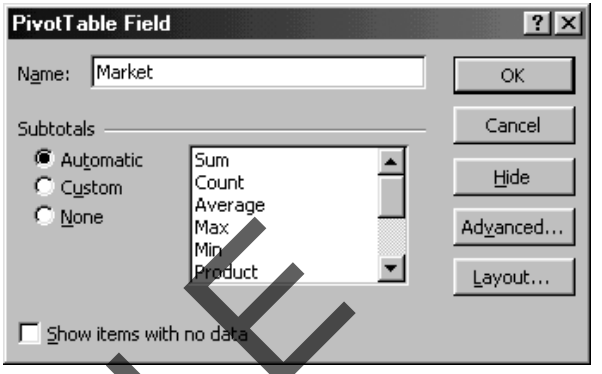
Inserting subtotals

With a PivotTable, you can insert automatic subtotals, delete subtotals, or insert subtotals and additional functions.

Drag at least two fields and position them next to one



another in a row. In the figure, the two fields that are placed in the row are the **Market** field and the **Customer Name** field.



The subtotals you insert are calculated for the items in the first field – **Market**. Double-click the **Market** field name (gray button). In the **PivotTable Field** window, there are three options for subtotals.

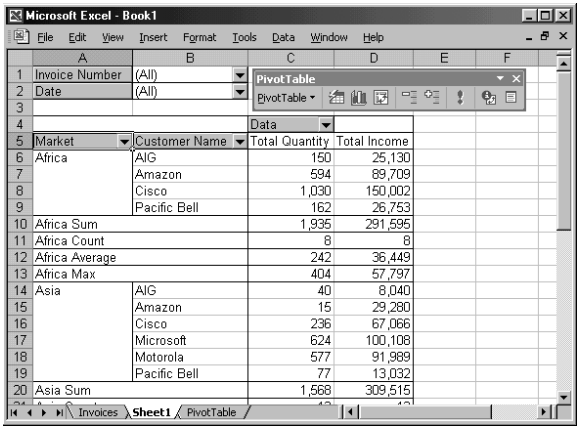
- Automatic
- Custom
- None

Automatic subtotals

Excel uses the SUM formula as the default for inserting sub-totals for an item in the **Market** field.

Custom subtotals

Select the **Custom subtotals** option, and select additional functions (see figure). Click **OK**.



None

Data is displayed without subtotals.

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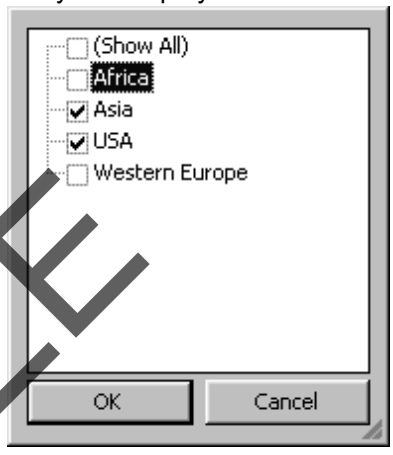
Hiding items

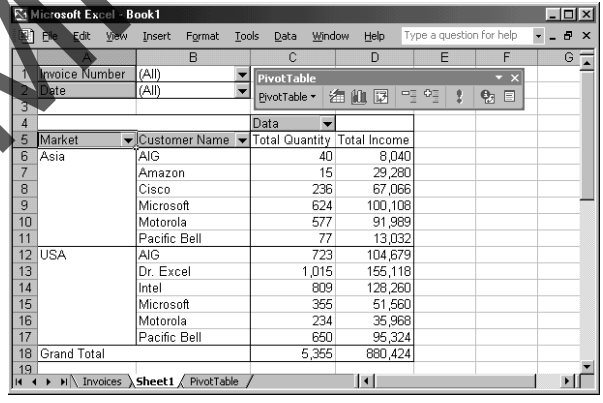
You can hide items to calculate sums for only the displayed items.



In Excel 97, double-click the name of the **Market** field, and in **Hide Items**, select the item called **Export**. Click **OK**

In Excel 2000 and 2002, click the arrow to the right of the **Market** field, and in the drop-down list, cancel the selection of the items you wish to hide.

In the figure, notice the item **Export** is not included in the list of items, and the data for the displayed items is totaled.



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Problem

There is a significant difference between the Hide techniques in Excel 97 and Excel 2000 and 2002.

Assuming the customer list is long and you are using Excel 97, to display an item from the reduced customer list by hiding the rest of the customers, you must hide every customer name separately (use **Shift** to select a non-valid series). In other words, this is not a simple solution.

In Excel 2000 and 2002, this problem does not exist. You simply cancel the selection of **Show All**, and select the items you want to display. The rest are already hidden.