



HOUR 18

Working with Pivot Tables

The topics in this hour are as follows:

- What you should know about pivot tables
- How to build a pivot table
- How to modify a pivot table
- How to work with PivotTable reports
- How to build a PivotChart

In this hour, you get to know a very powerful data analysis tool in Excel—the PivotTable. You can use a pivot table to summarize large amounts of information in a friendly, informative, interactive worksheet table. Also, you can create a PivotChart from pivot table information.

At the conclusion of this hour, you'll be creating simple pivot tables and charts to analyze vast amounts of data in your daily work.

What Is a Pivot Table?

A pivot table lets you analyze, summarize, and manipulate data in large lists, databases, worksheets, workbooks, tables, or other collections of data. Pivot tables offer flexible and intuitive analysis of data. It's called a *pivot table*

because you can move fields with the mouse to provide different types of summary lists; that is, the table can change, or “pivot.”

Although the data that appears in pivot tables looks like any other worksheet data, you cannot directly enter or change the data in the data area of a pivot table. The pivot table is linked to the source data, and what you see in the cells of the table are read-only amounts. However, you can change the formatting (Number, Alignment, Font, Border, Patterns) and choose from a variety of computation options such as SUM, AVERAGE, MIN, and MAX.

You can create a pivot table from several sources. The default, and most common choice, is to create a pivot table from an Excel list or database. You can also create a pivot table from an external data source, such as an Access database, multiple consolidation ranges, or another pivot table.

A Pivot Table Example

Suppose you have a list of magazine advertisements. A simple pivot table is useful for tracking the magazine advertisements for an accounting firm. Figure 18.1 shows an example of a worksheet with a list of magazine advertisements. It contains the month, magazine, and number of responses and new accounts. Figure 18.2 shows a typical pivot table for tracking the magazine advertisements.

FIGURE 18.1
List of magazine advertisements for an accounting firm.

1	Month	Magazine	Responses	New Clients
2	January	Accounting Weekly	25	10
3	January	Accounting Monthly	50	12
4	January	Accounting Times	65	15
5	February	Accounting Weekly	35	10
6	February	Accounting Monthly	68	9
7	January	Accounting Times	45	5
8	February	Certified Public Accountant	81	20
9	February	CPA Journal	50	15
10	January	Business Journal	78	14
11	January	Business Times	45	19
12	February	CPA Globe	19	20
13	February	Accounting Worldwide	56	30
14	February	Financial Times	87	15
15	January	Financial Street Journal	63	16
16	January	Business Arena	65	23
17	January	Money Journal	54	17
18	January	Investment America	80	21
19	February	Dollars and Sense	67	19
20	February	Financial Outlook	38	15
21				
22				
23				

FIGURE 18.2
Typical pivot table.

Magazine	January	February	Grand Total
1	19	20	20
2	25	10	10
3	35	10	10
4	38	15	15
5	45	24	24
6	50	12	15
7	54	17	17
8	56	30	30
9	63	16	16
10	65	38	38
11	67	19	19
12	68	9	9
13	78	14	14
14	80	21	21
15	81	20	20
16	87	15	15
Grand Total	152	153	305

In this hour, you learn how to create a pivot table just like the one in Figure 18.2.

Learning the PivotTable Lingo

Here is some PivotTable lingo that you need to know before you work with pivot tables.

- **Item**—An item label is a subcategory of a PivotTable field and is derived from unique entries in a database field or in a list column. Items appear as row or column labels or in the lists for page fields in a pivot table report.
- **Row field**—Row field labels have a row orientation in a pivot table report and are displayed as row labels. Appears in the ROW area of a pivot table report layout.
- **Column field**—Column field labels have a column orientation in a pivot table report and are displayed as column labels. Appears in the COLUMN area of a pivot table report layout.
- **Data field**—Data fields from a list or table contain summary data in a pivot table, such as numeric data (statistics, sales amounts, text). Summarized in the DATA area of a pivot table report layout.
- **Page field**—Page fields filter out the data for other items and display one page at a time in a pivot table report.

It's important to know what you want to do with your data in a PivotTable report. You need to know what you want to see. You might find it helpful to put what you want to learn in a series of questions. For example:

- How many new clients did we gain in January?
- Which magazine provided the highest number of new accounts for February?
- What's the average number of responses from the magazine advertisements?

Building a Pivot Table

You can build a simple pivot table with the Data, PivotTable and PivotChart Report option, which displays a series of PivotTable Wizard dialog boxes. The wizard steps you through the process of creating a pivot table, and you get to see a basic breakdown of the data you have in your Excel list or database. A diagram with the labels PAGE, COLUMN, ROW, and DATA appears, and you just drag field buttons onto the diagram. This step tells Excel about the data you want to analyze with a pivot table.

Perform the steps in the following To Do exercise to create a pivot table from an Excel list. Get ready to use the Data Analysis workbook you used in Hour 17, "Analyzing Your Data."

▼ To Do

To Do: Build a Pivot Table

1. In Sheet2 in the Data Analysis workbook, type the data shown in the worksheet in Figure 18.3. Click any cell in the list. Now the active cell is within the list, and Excel knows that you want to use the data in the Excel list to create a pivot table.
 2. Choose Data, PivotTable and PivotChart Report. If the Office Assistant asks whether you want help with pivot tables, choose No. The PivotTable and PivotChart Wizard—Step 1 of 3 dialog box opens, as shown in Figure 18.4. From this point, until the pivot table appears in the worksheet, you are working in the PivotTable Wizard.
 3. In the Where Is the Data That You Want to Analyze? area, choose Microsoft Excel List or Database if it's not already selected. This step tells Excel the source of the tabular data.
 4. In the What Kind of Report Do You Want to Create? area, choose PivotTable. Now Excel knows that you want to create a pivot table.
 5. Click the Next button. The PivotTable and PivotChart Wizard—Step 2 of 3 dialog box opens. In the Range box, the range should be \$A\$1:\$D\$20, which defines the data range you want to use for the pivot table. The range should include the columns headings in row 1.
- ▼

FIGURE 18.3

The data you need to enter in an Excel list.

	A	B	C	D	E	F	G	H	I
1	Month	Magazine	Responses	New Clients					
2	January	Accounting Weekly	25	10					
3	January	Accounting Monthly	50	12					
4	January	Accounting Times	65	15					
5	February	Accounting Weekly	35	10					
6	February	Accounting Monthly	68	9					
7	January	Accounting Times	45	5					
8	February	Certified Public Accountant	81	20					
9	February	CPA Journal	50	15					
10	January	Business Journal	78	14					
11	January	Business Times	45	19					
12	February	CPA Globe	19	20					
13	February	Accounting Worldwide	56	30					
14	February	Financial Times	87	15					
15	January	Financial Street Journal	63	16					
16	January	Business Arena	65	23					
17	January	Money Journal	54	17					
18	January	Investment America	80	21					
19	February	Dollars and Sense	67	19					
20	February	Financial Outlook	38	15					
21									
22									
23									

FIGURE 18.4

The PivotTable and PivotChart Wizard—Step 1 of 3 dialog box.

PivotTable and PivotChart Wizard - Step 1 of 3

Where is the data that you want to analyze?

Microsoft Office Excel list or database

External data source

Multiple consolidation ranges

Another PivotTable report or PivotChart report

What kind of report do you want to create?

PivotTable

PivotChart report (with PivotTable report)

Buttons: Cancel, < Back, Next >, Finish

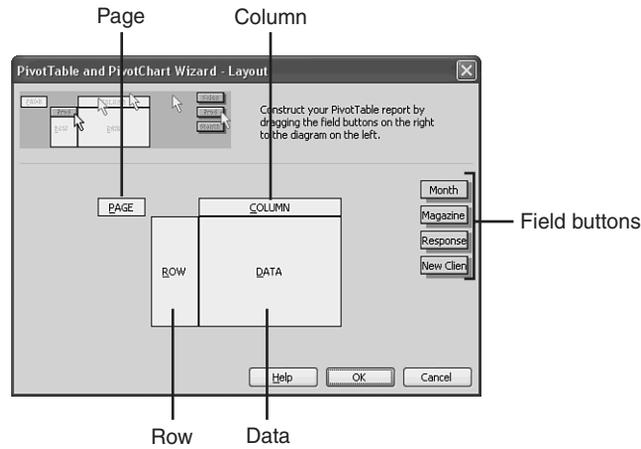


If the range is incorrect, click in the Range box and type the correct cell references. A quick way to specify the range in the Range box is to highlight the range in the worksheet.

- Click the Next button. The PivotTable and PivotChart Wizard—Step 3 of 3 dialog box opens. You use this dialog box to tell Excel whether to place the pivot table on an existing or new worksheet. In this case, you want to place the table on a new worksheet.

- ▼ 7. If necessary, choose New Worksheet.
- 8. The next step is to design the layout of the pivot table. Click the Layout button. Excel opens the PivotTable and PivotChart Wizard—Layout dialog box, as shown in Figure 18.5.

FIGURE 18.5
The PivotTable and PivotChart Wizard—Layout dialog box.



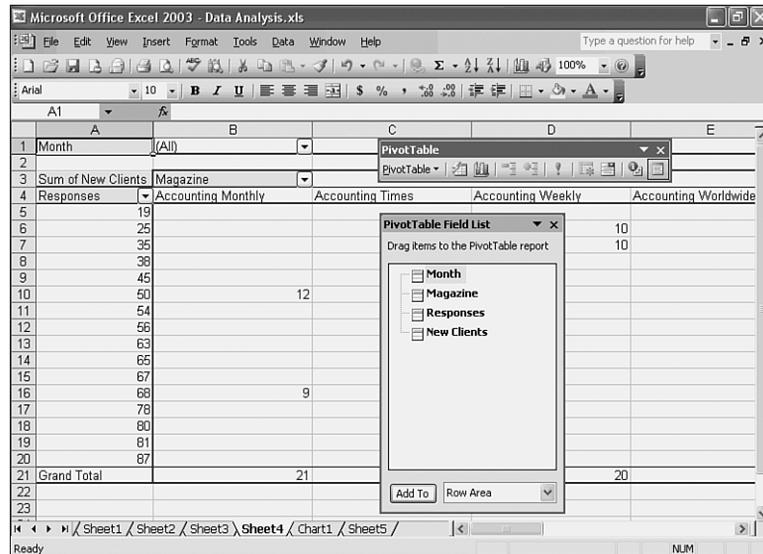
The fields appear on buttons to the right in the dialog box. These currently are the column fields. The four areas you can define to create your pivot table are ROW, COLUMN, DATA, and PAGE.

You drag the field buttons to the areas to define the layout of your pivot table. For example, to summarize the values in a field in the body of the table, place the field button in the DATA area. To arrange items in a field in columns with the labels across the top, place the field button in the COLUMN area. To arrange items in a field of rows with labels along the side, place the field button in the ROW area. To show data for one item at a time, one item per page, place the field button in the PAGE area.

- 9. Drag the Month button to the PAGE area.
- 10. Drag the New Clients button to the DATA area.
- 11. Drag the Responses button to the ROW area.
- 12. Drag the Magazine button to the COLUMN area.
- 13. Click OK to return to the PivotTable and PivotChart Wizard—Step 3 of 3 dialog box. Then click the Finish button. The PivotTable Wizard places the table in the new worksheet called Sheet4, as you can see in Figure 18.6. Also, the PivotTable toolbar and the PivotTable Field List should appear.



FIGURE 18.6
*The pivot table,
 PivotTable toolbar, and
 PivotTable Field List.*



Modifying a Pivot Table

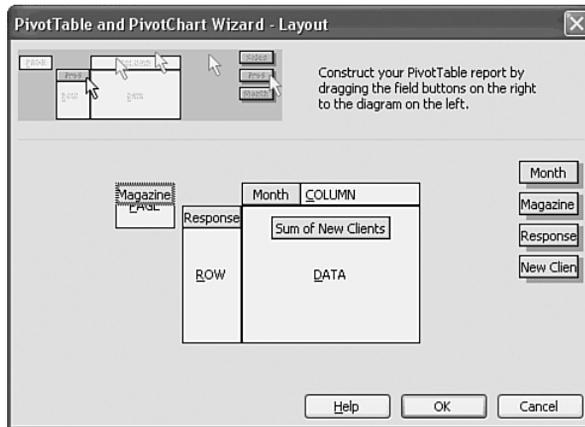
After you build a pivot table, you can make changes to it any time. For example, if you want to examine the new clients for a particular month, you need to change the Month field. Use the drop-down list to the right of the field name. Select a month and click OK. This step selects and deselects new clients in the list, and Excel instantly displays new clients broken down by more or less magazines in the DATA area of the pivot table. You also should see the grand total dollar amounts by magazine at the bottom of each item. At the bottom of the table, you should see the grand total for new clients to all magazines.

You can use this report to analyze your data in various ways. For instance, click the PivotTable down arrow button on the PivotTable toolbar, choose PivotTable Wizard, and click the Layout button. Drag the buttons off the diagram, and arrange the fields like this: Magazine in the PAGE area, Month in the COLUMN area, New Clients in the DATA area, and Responses in the ROW area. The completed PivotTable dialog box should look like the one in Figure 18.7.

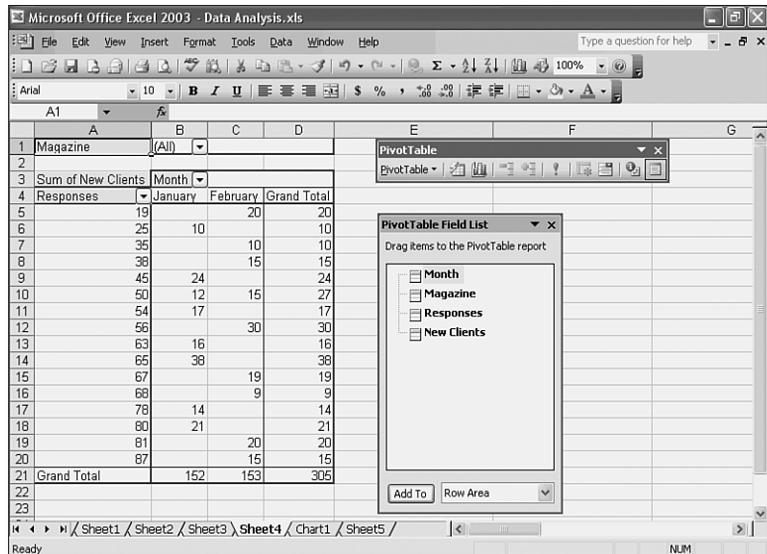
The pivot table now illustrates sales by cost for each item. All items are selected in the column field, and you should see the total item quantity for all the items. You can use the Cost row field to restrict cost shown to each individual item. Figure 18.8 shows the pivot table derived from rearranging the data.

FIGURE 18.7

Rearranging data in the PivotTable and PivotChart Wizard dialog box.

**FIGURE 18.8**

Rearranged data in the pivot table.



The PivotTable toolbar provides tools for working with pivot tables. Table 18.1 lists those tools and what they can do for you.

TABLE 18.1 PivotTable Tools

Tool	What It Does
PivotTable	A menu that contains commands for working with a pivot table.
Format Report	Enables you to format the pivot table report.
Chart Wizard	Enables you to create a chart using the data in the pivot table.
Hide Detail	Hides the detail information in a pivot table and shows only the totals.

TABLE 18.1 continued

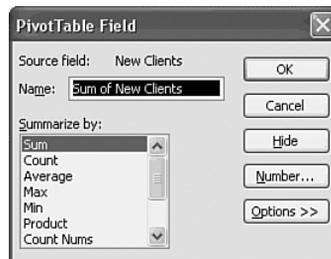
<i>Tool</i>	<i>What It Does</i>
Show Detail	Shows the detail information in a pivot table.
Refresh External Data	Allows you to refresh the data in the pivot table after you make changes to data in the data source.
Include Hidden Items in Totals	Lets you show the hidden items in the totals.
Always Display Items	Always shows the field item buttons with drop-down arrows in the pivot table.
Field Settings	Displays the PivotTable Field dialog box so that you can change computations and their number format.
Hide Field List	Hides and shows the PivotTable Field List window.

Below the buttons on the PivotTable toolbar, you should see the PivotTable Field List window. The field buttons that you dragged to the PAGE, ROW, COLUMN, and DATA areas in the PivotTable diagram appear in the window. You can drag a field button from the window to the PivotTable at any time to rearrange the data in your pivot table.

Some other changes you might want to make to your pivot table include removing and adding fields in the pivot table. To remove fields, drag the field item buttons off the PivotTable. Excel indicates in the pivot table exactly where you should place a field button. For example, in the PAGE area, you should see “Drop the page field here.” To add fields to the pivot table, drag the fields from the PivotTable Field List window into the PAGE, COLUMN, ROW, and DATA areas marked on the PivotTable. By using the PivotTable Field List window, you can build new or different pivot tables in a snap.

You can change the computation for the numbers. By default, the numbers are added with the SUM function, but you can change to AVERAGE, MIN, or MAX. For example, if you want to average the numbers instead of summing them, double-click the Sum of New Clients button in the DATA area. The PivotTable Field dialog box opens, as shown in Figure 18.9.

FIGURE 18.9
The PivotTable Field dialog box.



Choose Average and click OK. Excel changes the Sum of New Clients to Average of New Clients.



To change the format of numbers in a PivotTable, open the PivotTable Field dialog box, click the Number button and choose a number format. Click OK.

If you want to group PivotTable items and create a new field for the items as a group, select the cells you want to group. Choose Data, Group and Outline, Group. Excel creates a new field that contains the selected items.

To group items automatically, select one item in a field. Choose Data, Group and Outline, Group. In the Group Dialog box, in the By list, select the grouping options you want. Then click OK. Excel creates the groups based on the options you selected.

Working with Pivot Table Reports

Excel doesn't allow you to edit data in a pivot table report, because it maintains a link to the source data. But you can update the source file to pass any new or changed information to the pivot table. For example, any new clients will show up on the pivot table if you enter them into the source Excel list on the worksheet. After you change the source data, click the Refresh External Data button on the PivotTable toolbar. Excel returns any new or changed information to your table.

What if you want to change the orientation of the table? No problem. Just drag the field button to the new location. For instance, if you want to see the Month data in a row instead of a column, drag the Month field button from its place in the COLUMN area into the ROW area. Excel will automatically reformat the pivot table, reflecting the new information. You don't have to use the PivotTable Wizard dialog box here. Just make the change in the pivot table directly.

Another thing you can change in a pivot table report is a field name. Just click a field name in the pivot table and type over it with the new field name.

The totals in the table are computed for each subcategory in the row and for the column. When you add another row field, the pivot table displays a new subtotal field on the row. The same happens with column data. The data in every row and every column is totaled. There is a grand total field for the table, too.

If you want to hide the detail data in the pivot table report and show only the totals, select the data cell and click the Hide Detail button on the PivotTable toolbar. To switch back to showing the detail, click the Show Detail button on the PivotTable toolbar.

Building a PivotChart

A PivotChart is basically a column chart (by default) that is based on the data in a pivot table. You can change the chart to a different chart type if desired.

The next To Do exercise creates a PivotChart from an Excel list. You need to use the Excel list you created on Sheet2 earlier in this hour.

To Do: Build a PivotChart

▼ To Do

1. Click the Sheet3 tab and click any cell in the Excel list. This step tells Excel that you want to use the data in the Excel list to create a PivotChart.
2. Choose Data, PivotTable and PivotChart Report. If the Office Assistant asks whether you want help with pivot tables, choose No. The PivotTable and PivotChart Wizard—Step 1 of 3 dialog box opens. From this point, until the PivotChart appears in the worksheet, you are working in the PivotTable and PivotChart Wizard.
3. In the Where Is the Data That You Want to Analyze? area, choose Microsoft Excel List or Database if it's not already selected. This step tells Excel the source of the chart data.
4. In the What Kind of Report Do You Want to Create? area, choose PivotChart (with PivotTable), shown in Figure 18.10. Now you've told Excel that you want to create a PivotChart with a pivot table.

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FIGURE 18.10
The PivotTable and PivotChart Wizard—Step 1 of 3 dialog box.



5. Click the Next button. The PivotTable and PivotChart Wizard—Step 2 of 3 dialog box shows up. In the Range box, the range should be \$A\$1:\$D\$20, which defines the data range you want to use for the PivotChart.

▼



If the range is incorrect, click in the Range box and type the correct cell references. A quick way to specify the range in the Range box is to highlight the range in the worksheet.

6. Click the Next button. Excel asks whether you want to save memory and combine reports by placing the chart on the same sheet as the pivot table or keep the reports separate by placing the PivotChart on a chart sheet by itself. You want to keep the reports separate.
7. Choose No to separate the reports. The PivotTable and PivotChart Wizard—Step 3 of 3 dialog box opens. You can now tell Excel whether you want to place the PivotChart with pivot table on an existing or new worksheet. You want to place the chart and table on a new worksheet.
8. If necessary, choose New Worksheet.
9. The next step is to design the layout of the pivot table so that Excel can create the chart from the data in the table. Click the Layout button. Excel opens the PivotTable and PivotChart Wizard—Layout dialog box.

The fields appear on buttons to the right in the dialog box. These currently are the column fields. The four areas you can define to create your pivot table are ROW, COLUMN, DATA, and PAGE.

You drag the field buttons to the areas to define the layout of your pivot table. For example, to summarize the values in a field in the body of the table, place the field button in the DATA area. To arrange items in a field in columns with the labels across the top, place the field button in the COLUMN area. To arrange items in a field of rows with labels along the side, place the field button in the ROW area. To show data for one item at a time, one item per page, place the field button in the PAGE area.

10. Drag the New Clients button to the DATA area.
11. Drag the Magazine button to the ROW area. Your pivot table diagram should resemble the one in Figure 18.11.
12. Click OK to return to the PivotTable and PivotChart Wizard—Step 3 of 3 dialog box. Then click the Finish button. The PivotTable Wizard places the chart in the new worksheet called Chart1, as you can see in Figure 18.12. Also, the PivotTable toolbar and PivotTable Field List window should appear. Close the toolbar and the window.

FIGURE 18.11
*The PivotTable and PivotChart Wizard—
 Layout dialog box.*

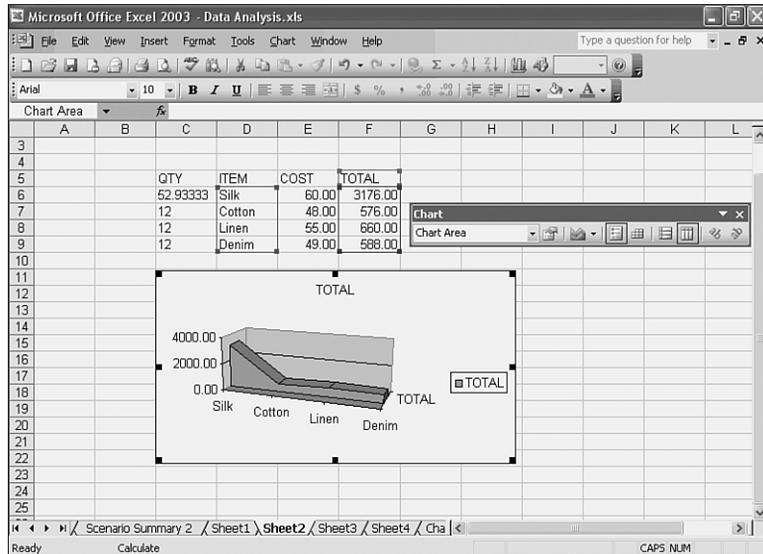
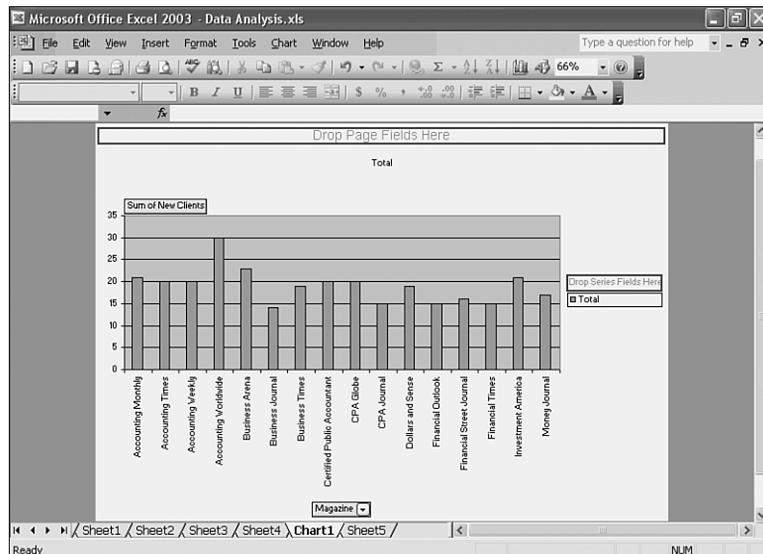


FIGURE 18.12
The PivotChart.



Creating a Chart from PivotTable Report Data

**NEW
2003**

What if you don't want to create a PivotChart that interacts with the data in the PivotTable report? You can create an ordinary, non-interactive chart to represent the pivot table data. To do so, select the data in the PivotTable report that you want to include

in your chart. If you want to include field button data in the first row and column of the PivotTable report, select the data by dragging from the bottom right corner of the data.

Click the Copy button on the Standard toolbar. Click in a cell in a blank area. Choose Edit, Paste Special. Click Values, and then click OK. Create your chart using the Chart Wizard. For instructions on how to use the Chart Wizard, see Chapter 12, “Adding a Chart.”

Summary

In this hour, you learned the ABCs of building and modifying pivot tables, and you worked with pivot table reports. When you want to use Excel to manage a list of data, but you’re not sure whether Excel can handle everything, give it a try. You have little to lose, because you can always move your data around, from row to column to data and back, and by adding and removing fields from the pivot table.

The next hour teaches you all about integrating Excel with other Office applications.

Q&A

Q The cell references in the Range box in the first PivotTable and PivotChart Wizard dialog box are wrong. What next?

A If the range is incorrect, click in the Range box and type the correct cell references. A quick way to specify the range in the Range box is to highlight the range in the worksheet.

Q I want to change the data in the pivot table, but Excel won’t let me. What can I do?

A Excel doesn’t allow you to change the data directly in the pivot table, but you can change the data in the source, such as the Excel list. After you make the changes, click the Refresh External Data button on the PivotTable toolbar to update the data in the pivot table, reflecting the changes you made in the source list.

Q After I create a pivot table, can I change the way the data is arranged, or do I have to create a new table?

A It’s never too late. You can change the data arrangement by clicking the PivotTable Wizard button on the PivotTable toolbar and then clicking the Layout button. Drag the field buttons off the diagram to start fresh. Then drag the field buttons back to diagram to rearrange the data.

Q What can I do with the field buttons in the PivotTable Field List window?

A You can drag them to the pivot table to change the arrangement of your data quickly.

Q What if I want to show only the totals in my pivot table report?

A After selecting the data item, just click the Hide Detail button on the PivotTable toolbar to show only the totals and hide the detail information. When you want to display the detail again, click the Show Detail button on the PivotTable toolbar.