

# Microsoft Excel 2010 Step-by-Step Exercises

## PivotTables and PivotCharts: Exercise 1

In this exercise you will learn how to:

- Create a new PivotTable
- Add fields to a PivotTable
- Format and rename PivotTable fields
- Rearrange PivotTable fields
- Remove fields from a PivotTable

### Introduction

These exercises are designed to help you learn how to build PivotTables and PivotCharts in Microsoft Excel 2010. They will guide you step-by-step through the various processes whilst at the same time explaining exactly what you are doing and why you are doing it.

The exercises use the file *CommodityShipments (PivotTables PivotCharts).xlsx* which you can download from my web site at <http://www.fontstuff.com/training/excel/stepbystep.htm>

To get the greatest benefit from the exercises you should work through the steps on your own computer using the sample file or files provided. You can work at your own pace. The steps are numbered so if you want to take a break you can make a note of how far you have got and start from the same place when you resume. Don't forget to save your work if you close the file.

Each step of the process is labelled in bold, for example, **Step 3:**. Follow the instructions exactly and do not leave any steps out. Occasionally you will see paragraphs labelled **Try this:**. These are optional actions which help illustrate particular features. You can choose to follow these instructions or not. This will not affect the progress of the exercise but will help you learn more about the topic. It is also important that you do not do anything else in the exercise workbook whilst performing the exercise, although you can work in other workbooks if you need to.

Between the various steps you will find text and screenshots explaining and illustrating what is going on. You can choose to ignore this if you wish but you will learn more quickly if you understand what you are doing and why, so I recommend that you read them.

### Review the Data

**Step 1:** Start Excel then open the file *Commodity Shipments (PivotTables and PivotCharts).xlsx* and take a look at the different worksheets.

The exercise file contains four worksheets:

- **Commodity Shipments** This worksheet contains a copy of the data that you will be working with during the exercises.
- **Pivot Table** On this worksheet there is a PivotTable based on the data on the first worksheet. There are also two Slicers. You will build a PivotTable just like this one.
- **Pivot Chart** This worksheet has a PivotChart in addition to a PivotTable and a pair of Slicers. You will also build a PivotChart like this one.
- **Exercise** This worksheet has another copy of the data. It is exactly the same as the data on the first sheet but, since you will be making some changes to it, I have supplied you with a separate set of data.

There are 500 rows of data. Each row describes a shipment from one country to another. The year and month of the shipment are shown, as well as the weight of the shipment in tonnes. Also shown is the name of the country from which the shipment originated and the name of the destination country. The shipments comprise a number of different commodities, mostly grains.

The rows of data are randomly arranged and not sorted into any specific order. This is to illustrate that data does not have to be organised in a particular way for analysis with a PivotTable or PivotChart. The only prerequisite is that the data is arranged in columns with a meaningful heading at the top of each column.

## Create a PivotTable

**Step 2:** Go to the sheet named **Exercise** and select any cell in the data making sure that you select only one cell, then go to the **Insert** tab and click the **PivotTable** button (Fig. 1).

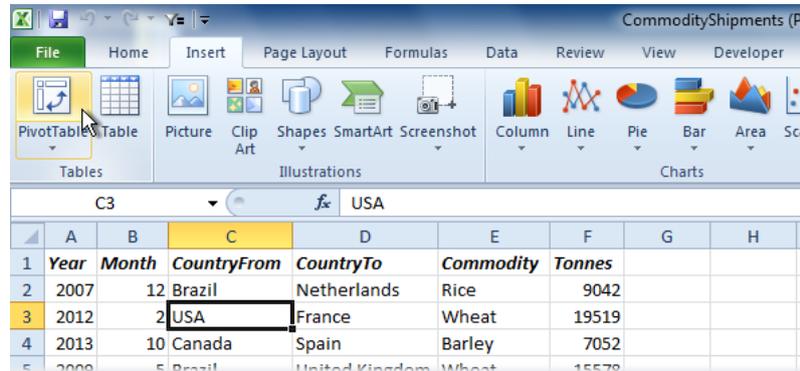


Fig. 1 Go to the **Insert** tab and click the **PivotTable** button.

The *Create PivotTable* dialog box appears (Fig. 2) and Excel automatically selects the entire block of data on the sheet and enters its address in the *Table/Range* textbox. When working with your own data you should check that Excel has selected the correct data. If not, at this stage you can manually select the data you want to analyse or enter its address in the textbox.

Note that the *Create PivotTable* dialog offers the option to *Use an external data source* (such as a different workbook or an external database). This will be the subject of different exercise.

It also allows you to specify a location for the PivotTable, the default being a *New Worksheet*. If you wanted to create the PivotTable on a specific worksheet you would select *Existing Worksheet* (it must be an existing one because you can't create a sheet whilst the dialog box is open). You would then click in the *Location* textbox, navigate to the appropriate sheet and select the cell where you wanted the PivotTable to start.

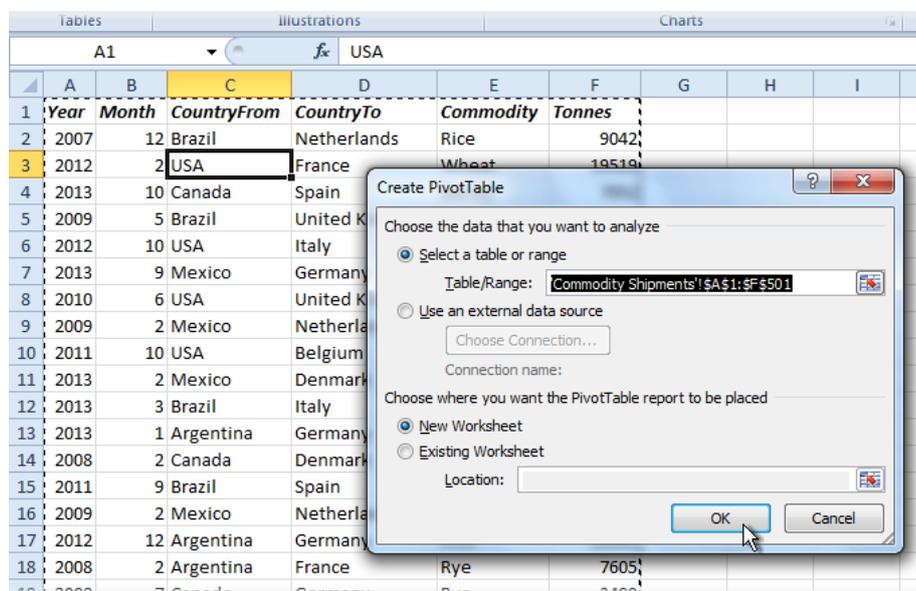


Fig. 2 Accept the default settings and click the **OK** button.

**Step 3:** In this exercise you are going to create a PivotTable on a *New Worksheet* so leave that option selected and click the **OK** button.

Excel creates a new worksheet, here named *Sheet1*, to the left of the *Exercise* sheet and adds an empty PivotTable to it (Fig. 3). Before starting to create the PivotTable take a look around the workspace.

Excel has added two new tabs to the ribbon under the heading *PivotTable Tools*. The tabs are labelled *Options* and *Design*. You will use these later to customise your PivotTable. The *Options* tab is selected and three buttons have been activated at its right-hand side. You will find out later what these buttons do.

On the left side of the worksheet there is a rectangle containing some instructions and a diagram. This is where the PivotTable will be created. Note that it shows the name of the PivotTable as *PivotTable 1*. A PivotTable can be given a unique name which can be useful if it is to be manipulated using macro (VBA) programming or interrogated using one of Excel's PivotTable functions.

On the right side of the worksheet is the *Field List*. This is where you do the basic design work to create the PivotTable.

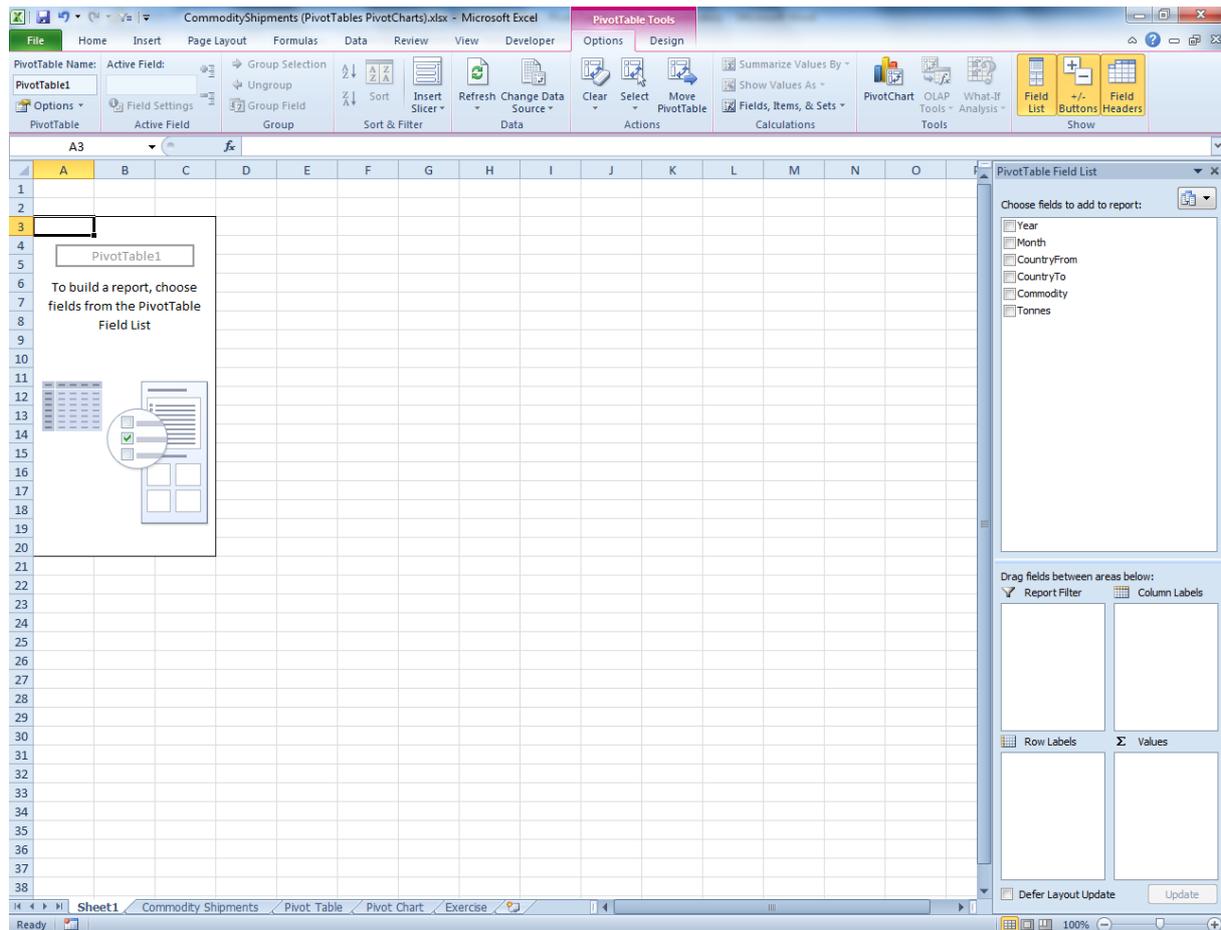


Fig. 3 Excel creates a new worksheet containing an empty PivotTable.

**Try this:** Click on any cell in the centre of the worksheet. See that the two *PivotTable Tools* tabs and the *Field List* have disappeared. Remember that these tools will only be shown if the PivotTable is selected. The text on the Pivot Table has also changed, instructing you to click it to start building your PivotTable so click anywhere in the rectangle to bring back the ribbon tabs and the *Field List*.

**Try this:** On the *Options* tab click the button marked *Field List* to deactivate it. See that the *Field List* disappears but the PivotTable tabs remain. This button is used to hide the *Field List* when it is not needed. Click the button again to bring back the *Field List*.

**Step 4:** In the **PivotTable Field List** click the checkbox next to **CountryFrom**.

This puts a tick in the checkbox and Excel places a button labelled with that field's name in the *Row Labels* box at the bottom of the *Field List*. It also starts to build the PivotTable by creating a list of country names where the rectangle on the left of the window stood (Fig. 4).

Excel has scanned through the *CountryFrom* column of the data and returned a list of all the unique items it found, and sorted them alphabetically.

Note that at the top of the list there is a cell containing the text *Row Labels*. The cell also contains a filter button. At the bottom of the list there is a cell containing the text *Grand Total*.

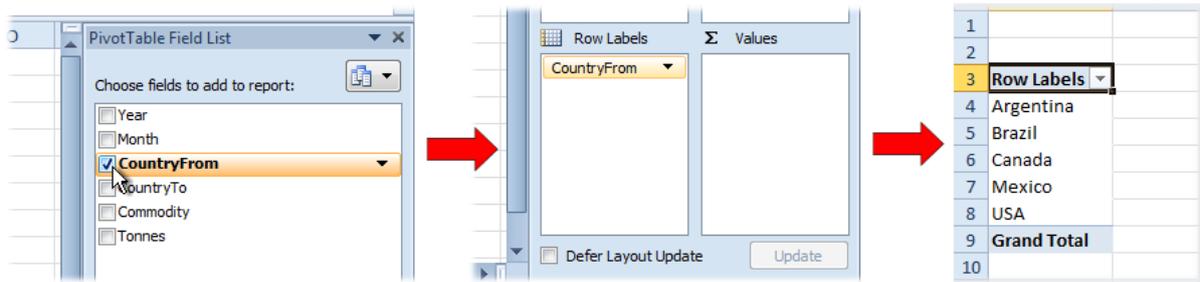


Fig. 4 Excel begins to build the PivotTable

**Step 5:** In the **PivotTable Field List** click the checkbox next to **Tonnes**.

This puts a tick in the checkbox and Excel places a button labelled with that field's name in the *Values* box at the bottom of the *Field List*. It has also added a column on numbers to the PivotTable (Fig. 5).

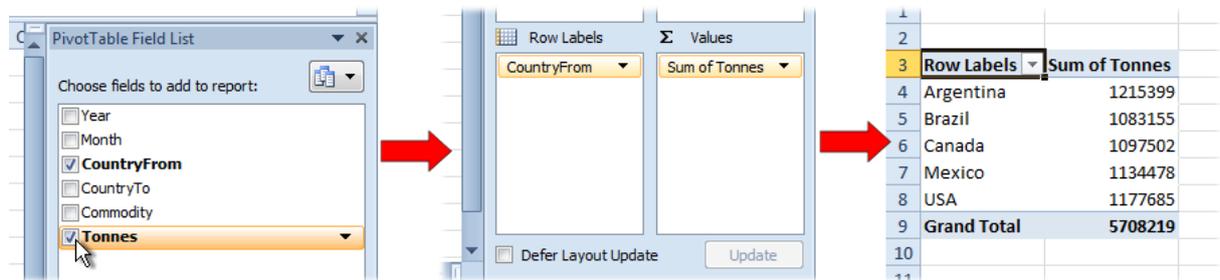


Fig. 5 The Tonnes field is added to the PivotTable.

Excel deduced that the field you selected contained numerical values that it could calculate, so it automatically added the field to the *Values* part of the PivotTable. It analysed the values it found and summarised the data by the field that was already in the PivotTable. It labelled the new PivotTable column Sum of Tonnes. Each number represents the total of the Tonnes values for each country in the CountryFrom column of the data, and placed a grand total at the foot of the PivotTable column.

## Format the Numerical Data

Unformatted numbers are hard to read so let's add some formatting to the *Tonnes* field...

**Step 6:** In the **Values** box of the **PivotTable Field List** click the down-arrow on the button labelled **Sum of Tonnes** then choose **Value Field Settings** from the menu (Fig. 6).

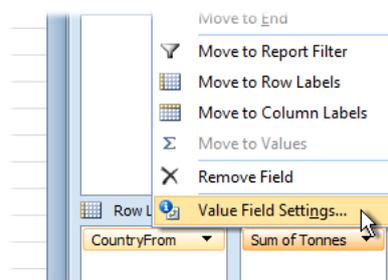


Fig. 6 Select Value Field Settings.

This opens the *Value Field Settings* dialog box. Here you can customise the appearance of the selected field. You can also specify what sort of calculation is performed. You could, for example, choose *Count* so see the total number of shipments for each country, or display the *Average* size of each country's shipments. There are several other options that we will explore later.

**Step 7:** In the **Custom Name** textbox of the **Value Field Settings** dialog, change the field's label to **Total Tonnes**.

**Step 8:** Click the **Number Format** button in the lower left corner of the **Value Field Settings** dialog to open the **Format Cells** dialog and under **Category** click **Number**. Set the **Decimal places** value to **0** and place a tick in the **Use 1000 Separator** checkbox (Fig. 7).

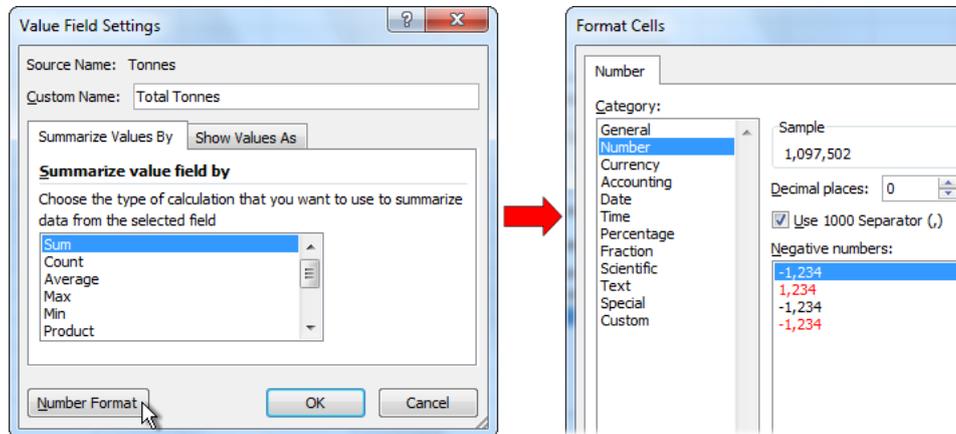


Fig. 7 Specify a Custom Name and Number Format.

**Step 9:** Click **OK** to close the **Format Cells** dialog then click **OK** to close the **Value Field Settings** dialog.

The numbers on the pivot table have now been formatted to the comma style with no decimal places and the field label has changed to *Total Tonnes* (Fig. 8).

1		
2		
3	Row Labels	Total Tonnes
4	Argentina	1,215,399
5	Brazil	1,083,155
6	Canada	1,097,502
7	Mexico	1,134,478
8	USA	1,177,685
9	Grand Total	5,708,219
10		

Fig. 8 Custom field settings have been applied.

## Add a Second Field

Until now we have let Excel decide how to arrange the fields on the PivotTable, but you can easily place the fields exactly where you want them.

**Step 10:** Point at the **Commodity** field button in the **PivotTable Field List** and drag it into the **Column Labels** box (Fig. 9).

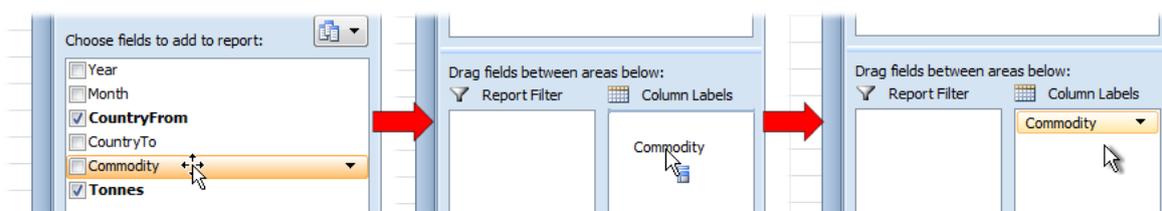


Fig. 9 Drag the Commodity field into the Column Labels box.

Excel has added the Commodity field to the PivotTable and created table of data in which the Tonnes values have been recalculated to show the Totals for each exporting Country (CountryFrom) by Commodity. As it did previously with the CountryFrom data, Excel has analysed the Commodity data and identified all the unique items, then used each one as a label for the new columns in the PivotTable (Fig. 10). It has also added a grand total for each row.

Note that in order to accommodate the new headings the table has moved down the sheet a little way. This is one of the reasons why it is a good idea when formatting PivotTable data to apply the formatting the field using *Value Field Settings*, as you did earlier, rather than simply formatting the cells.

1								
2								
3	<b>Total Tonnes</b>	<b>Column Labels</b>						
4	<b>Row Labels</b>	<b>Barley</b>	<b>Maize</b>	<b>Rice</b>	<b>Rye</b>	<b>Soybeans</b>	<b>Wheat</b>	<b>Grand Total</b>
5	Argentina	82,044	135,388	209,783	80,722	259,954	447,508	1,215,399
6	Brazil	157,614	233,825	123,719	90,764	323,196	154,037	1,083,155
7	Canada	179,232	211,403	255,634	82,979	162,405	205,849	1,097,502
8	Mexico	129,087	255,211	170,393	98,719	201,572	279,496	1,134,478
9	USA	90,541	214,349	127,518	107,889	265,155	372,233	1,177,685
10	<b>Grand Total</b>	<b>638,518</b>	<b>1,050,176</b>	<b>887,047</b>	<b>461,073</b>	<b>1,212,282</b>	<b>1,459,123</b>	<b>5,708,219</b>
11								

Fig. 10 Excel has added the Commodity field to the PivotTable.

Note also that Excel has now placed a tick in the checkbox next to Commodity in the PivotTable Field List, indicating that the Commodity field is currently represented in the PivotTable. The names of fields included in the PivotTable are also shown in **bold**.

## Removing and Moving Fields

There are two ways to remove a field from the PivotTable.

**Step 11:** Click the checkbox adjacent to **Commodity** in the **PivotTable Field List** to remove the tick from the box.

As you would expect the PivotTable returns to its previous appearance as shown in Fig. 8.

**Step 12:** Click the **Commodity** checkbox so that it is ticked again.

Excel restores the *Commodity* field to the PivotTable but this time it has decided to place it in the *Row Labels* box below the *CountryFrom* field. Although the same fields are being displayed in the PivotTable its appearance is now quite different. The calculated values from the *Tonnes* field are the same as before, just displayed in a different way. The *Total Tonnes* of each *Commodity* are now shown for each *CountryFrom*.

2		
3	<b>Row Labels</b>	<b>Total Tonnes</b>
4	Argentina	1,215,399
5	Barley	82,044
6	Maize	135,388
7	Rice	209,783
8	Rye	80,722
9	Soybeans	259,954
10	Wheat	447,508
11	Brazil	1,083,155
12	Barley	157,614
13	Maize	233,825
14	Rice	123,719
15	Rye	90,764
16	Soybeans	323,196
17	Wheat	154,037
18	Canada	1,097,502
19	Barley	179,232
20	Maize	211,403

Fig. 11 The Commodities are shown below each Country.

**Step 13:** Go back to the **PivotTable Field List** and in the **Row Labels** box drag the **CountryFrom** button downwards and drop it underneath the **Commodity** button.

Again Excel rearranges the PivotTable so that the *Total Tonnes* of each *CountryFrom* are now shown for each *Commodity* (Fig. 12). These few examples are beginning to illustrate the power of Excel's PivotTable tool.

2		
3	Row Labels	Total Tonnes
4	Barley	638,518
5	Argentina	82,044
6	Brazil	157,614
7	Canada	179,232
8	Mexico	129,087
9	USA	90,541
10	Maize	1,050,176
11	Argentina	135,388
12	Brazil	233,825
13	Canada	211,403
14	Mexico	255,211
15	USA	214,349
16	Rice	887,047
17	Argentina	209,783
18	Brazil	123,719
19	Canada	255,634
20	Mexico	170,292

Fig. 12 The Countries are shown below each Commodity.

When data is shown this way it is said to be *grouped*. Currently (Fig. 12) the *CountryFrom* data is grouped by *Commodity*. Previously (Fig. 11) the *Commodity* data was grouped by *CountryFrom*.

When data is grouped like this Excel places a small button containing a minus sign next to each group item. This is used to group and ungroup the field items.

**Step 14:** Click each of the **minus buttons** to collapse each of the **Commodity** groups.

As you do this Excel recalculates the *Tonnes* values and displays a total for each group (Fig. 13) and each minus sign is replaced by a plus sign.

2		
3	Row Labels	Total Tonnes
4	Barley	638,518
5	Maize	1,050,176
6	Rice	887,047
7	Rye	461,073
8	Soybeans	1,212,282
9	Wheat	1,459,123
10	Grand Total	5,708,219
11		

Fig. 13 The Commodity Groups have been collapsed to show totals.

**Step 15:** Click each of the **plus buttons** to expand each of the **Commodity** groups.

The PivotTable now shows all the data again. Here's another way to remove a field from the PivotTable...

**Step 16:** In the **PivotTable Field List** drag the **Commodity** button out of the **Row Labels** box into an empty space (such as over the worksheet) so that a cross appears next to the mouse pointer, then release the mouse button.



Fig. 14 Drag the Commodity button into a space.

## Conclusion

This concludes Exercise 1. The next exercise will continue from this point so if you wish to proceed to the next exercise you should save the file in its current state.