



Activity

Building Charts using RBA Statistical Tables



Introduction

Charts (or graphs) are diagrams which serve as visual representations of data.

Microsoft Excel is a useful application you can use to build charts. This Activity will help you to gain confidence in using Excel to build charts. A basic knowledge of Excel is assumed. If you have never used Excel, consult an online tutorial to familiarise yourself with the basic functionality of this application before proceeding. The instructions in this Activity are based on the features of Microsoft Excel 2007. You can learn more about charts in the Activity: Interpreting and Analysing Charts.

Working with RBA statistical tables

The RBA website houses a wealth of statistical information that can be downloaded as Excel spreadsheets and used to build great charts. However, there is a lot of detail in these spreadsheets. Below are some tips and tools you can use to work with RBA statistical tables.

Tips for reading RBA statistical tables

- Many statistical tables on the RBA website contain multiple columns of data about a certain topic within the one file. Each column of data represents a different data series.
- Read the titles of each data series across the spreadsheet to see the range of information contained in the file. This will help you determine which columns will be the most relevant for your purposes, or whether you need to consult another statistical table.
- Ensure you read the detail about the data before using the data. This detail contains important information such as: a description of what the data series measures, how frequently the data are reported, whether the data series has been adjusted (for example, seasonally adjusted to remove seasonal patterns), the units the data are measured in, and the source. Once you find a dataset that suits your purposes, copy the entire column of data into a new Excel spreadsheet so you can easily work with it to build your chart.

Preparing your dataset

Given that the data series determines what is displayed on the chart, it is worth spending some time assessing whether you have the right data series to build a chart.

Some questions to ask yourself include:

- ✓ **Do you have proper x and y variables?**
 - Without correct x and y variables, the relationship displayed on your chart will not make sense.
 - The x variable is your independent variable. It can stand alone and is not dependent on any other factor for its value (e.g. time is an independent variable).
 - The y variable is your dependent variable. Its value is dependent on the x variable and is typically what is being measured (e.g. inflation rate (y) over time (x), where the inflation rate is dependent on what point in time you are looking at).
- ✓ **What units best display the data you wish to present?**
 - Think about the information you want to present and the question you are trying to answer. For example, are your data best represented in levels (for example, number of dollars), or as a rate of change?
 - Changing the way you present your data can make a difference in terms of the usefulness to the reader and will affect the relationships/trends you are able to demonstrate in your chart.
- ✓ **What scale should I use for my x and y axes?**
 - **X axis:** If you are graphing a data series over time, the scale you use for this axis will affect the sample period of data that is displayed on your chart (e.g. are you graphing a variable over 1 year, or over 10 years?). For example, you may choose to display data on the exchange rate for the past three months to focus on recent movements. Or you may wish to display the data from 1983 to show trends in the exchange rate since the Australian dollar was floated.

- **Y axis:** The scale you choose for this axis will affect the level of detail on your chart. First, you want to pick a scale which allows all data points to fit on the chart. Second, you want to think about the appropriate scale for your reader. What level of detail do they need to see? If small variations are important, then small increments in the y axis are appropriate.

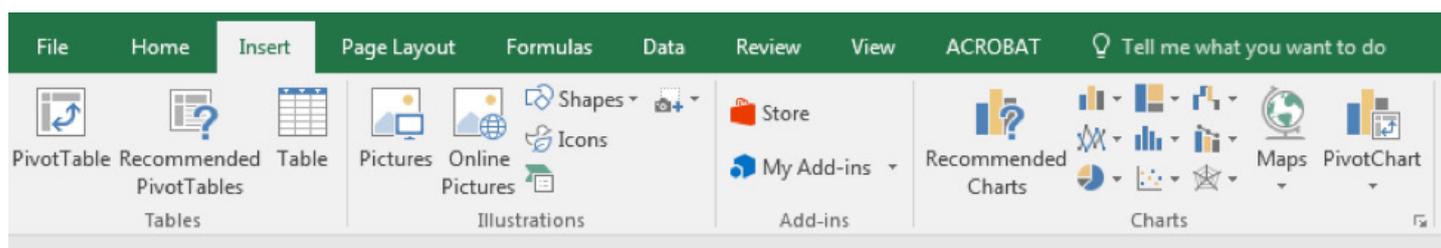
Choosing a chart type

Now that you have prepared your dataset, you can begin building your chart! It is good to get into the habit of putting your data into an organised table with proper headings as it will make building your chart easier.

For example:

	quarter	year-ended inflation (%)
X axis	March 2013	2.5
	June 2013	2.4
	September 2013	2.2
	December 2013	2.7

Highlight the information you want included in your chart and go to the Insert tab at the top navigation ribbon in Excel. Here you will find an area designated for Charts. If you hover over the different chart type categories, you can read about the functions and uses of the various options.



It is useful to read about the different types of charts to familiarise yourself with their uses. More chart options will appear once you click into one of these categories. You will also be able to preview what your chart will look like by hovering over a specific chart within the dropdown menu.

Picking an appropriate chart type is important as it can affect how the reader interprets your chart and how useful the information is to the reader.

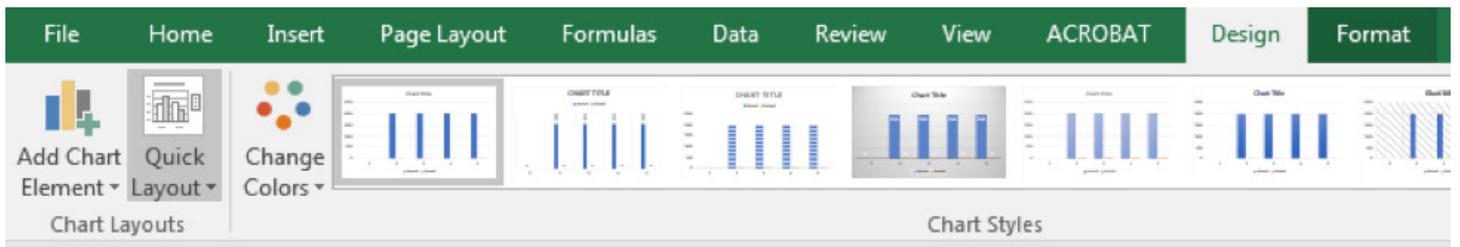
For example:

Concept	Possible chart type	
Economic indicators over the last 5 years	Line chart (used for displaying data over time)	
GDP growth (broken down by component) over the last 10 years	Stacked column chart (used for showing how parts of a whole have changed over time)	
Allocation of government budget for the year	Pie chart (used for showing proportions of a whole)	

Putting the finishing touches on your chart

At this stage, there are only a few more things you should consider to put the final changes on your chart. You want to maximise the amount of information you can convey on your chart but you don't want to make it look too cluttered.

Most features listed below can be added or edited using the Design and Format tabs in the top navigation ribbon in Excel. Alternatively, double-clicking into an area of the chart you want to edit (e.g. an axis; a title; a data series or one data point, etc.) will also allow you to make changes or bring you to the appropriate page where you can make your edits.



The more you play around with the content in these two tabs, the more familiar you will become with the functionality of the Excel Chart Tools. If you have time, consider playing with the features in these tabs to see what happens to your chart. If you are having trouble, consult an online tutorial for more guidance.

Things to consider:

A. Title

- The title is important as it helps to identify what your chart is representing. Make sure your title is clear and concise! For example, in the chart below the title clearly indicates what is being graphed (GDP Growth).

B. Axis / Units

- Axes labels are equally important as they identify what is being graphed on the x and y axes. It is important to convey what units the reader is looking at.
 - The y axis should include an appropriate scale and the units should be clearly labelled. (Tip: you can change the display units and format of your scale by double-clicking on it without having to change the values in your dataset.)
 - The x axis should also be clearly labelled.

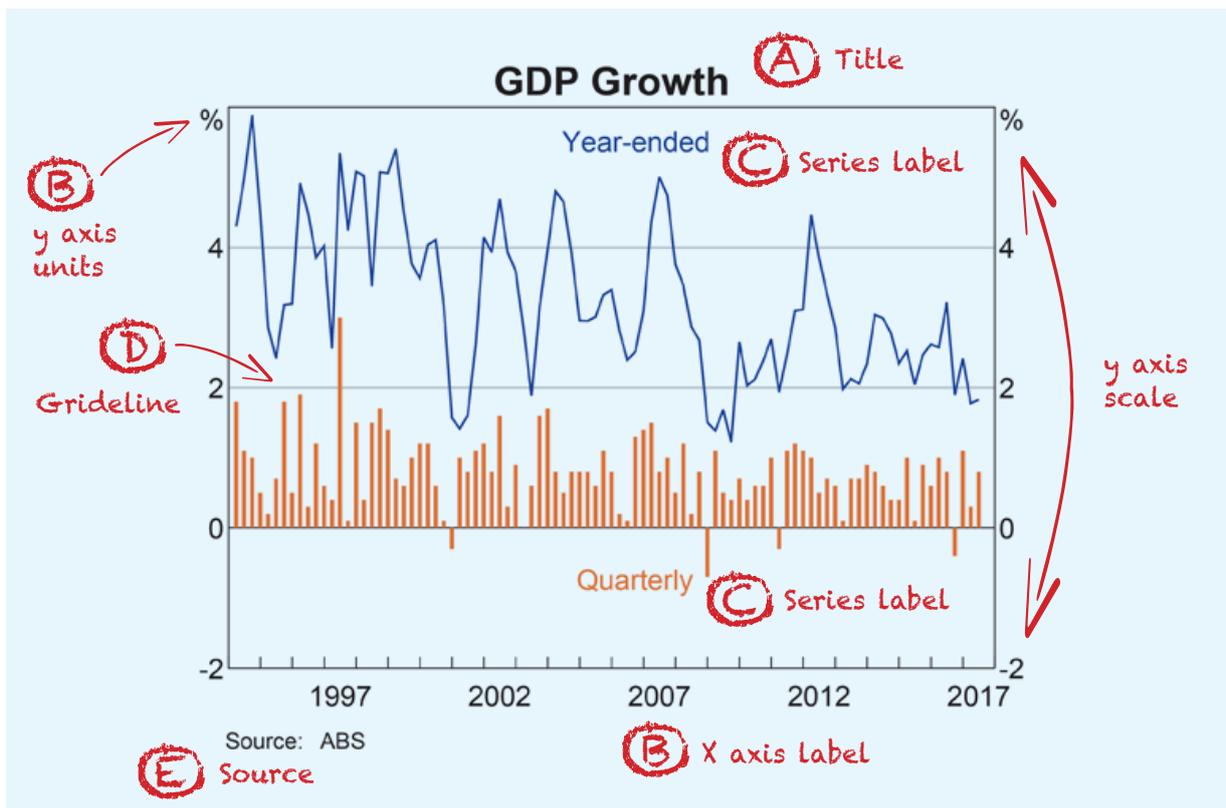
C. Series labels are also important when there is more than one data series as it allows the reader to discern between the different data series.

- You can also use Excel to add a trendline to your chart. Use the Excel search function to find out how.

D. Include gridlines to help your reader interpret the chart.

E. Add the source where you accessed your data.

Remember, you only have a limited amount of space to work with in a chart, so only add features which add value to your chart. A cluttered chart will be confusing to read.



Test out your skills

1. Under the Statistics tab on the RBA website, locate the Statistical Tables page.
2. Choose a statistical table from which you would like to produce a chart and click on it to download the spreadsheet. (Note: If this is your first time using the RBA statistical tables to build a chart, start with the Monetary Policy Changes – A2).
3. Copy the contents of Column A in your downloaded file into Column A of a new workbook in Excel. This will provide the x axis of your chart.
4. Go back to your statistical table spreadsheet. Read the various columns of data to ascertain what is in the spreadsheet. Once you have identified a data series that you wish to graph, copy the contents of the entire column, and paste it in Column B of the same workbook you used in Step 3. This will provide the y axis of your chart.
5. Save this workbook on your computer as this will be the file you work in to produce your chart.
6. Before starting, take a scroll through your dataset and take note of a few things:
 - What is the frequency with which the data are presented? (e.g. quarterly; as announced; yearly, etc.)

 - What units are your data in? (e.g. dollars, per cent, etc.)

 - When does your data series start? If there are empty rows, why were there no data for these observations?

7. Follow the steps outlined on pages 1–3 of of this Activity to complete your chart.
8. Select the chart and copy and paste a new version into a different area on your work sheet. We will use this chart to perform a few simulations to see what happens when you change various features on a chart.
 - Chart type:
 - What chart type are you currently using for your chart?
 - Change the chart type to a completely different one (e.g. if you were using a column chart, change it into a line chart).
 - What chart type did you switch to?
 - How did this affect the presentation of your chart? Is it still meaningful? Why or why not?

 - Are there any other chart types that you think would also be effective for your chart? Why?

- Y axis:
 - What happens to the presentation of your chart when you double the units of the scale used on your y axis?

 - Undo this change to go back to the original scale you were using. What happens to the presentation of your chart when you halve the units of the scale used on your y axis?

- How would changing the scale provide a different representation?
Explain why and how this would influence the reader's interpretation.

- X axis:

- What happens to the presentation of your chart if you only show half of the data in your dataset?
(e.g. if your data series covers 10 years, change the chart so that it only covers 5 years of data)

- What happens to the presentation of your chart if you only show one year of data?

- How would changing the time period provide a different representation?
Explain why and how this would influence the reader's interpretation.

Extension:

Repeat the exercise with two datasets which you believe are complementary.

- Remember to make sure the x axes match up on both datasets and that the data series are formatted appropriately if they are different units (e.g. dollars vs. percentages). For example, you may need to use a different y axis for each data series – one on the left hand side and one on the right hand side.