8.10 Exercise: Time Series analysis for more than one series

This exercise will enable you to use iNZight to compare several time series by viewing them simultaneously in two different ways.

[***iNZight Lite version*** *linked here*]

*[Late breaking … **R version***]

INSTRUCTIONS

Follow the instructions below to generate the graphs. Or you may prefer to **print the instructions**.

Load the **Week8_AverageVisitorsQuarterly** dataset into iNZight using **File > Example data ….** You will find the data set in **Module (package)** *FutureLearn*.

Comparing several series

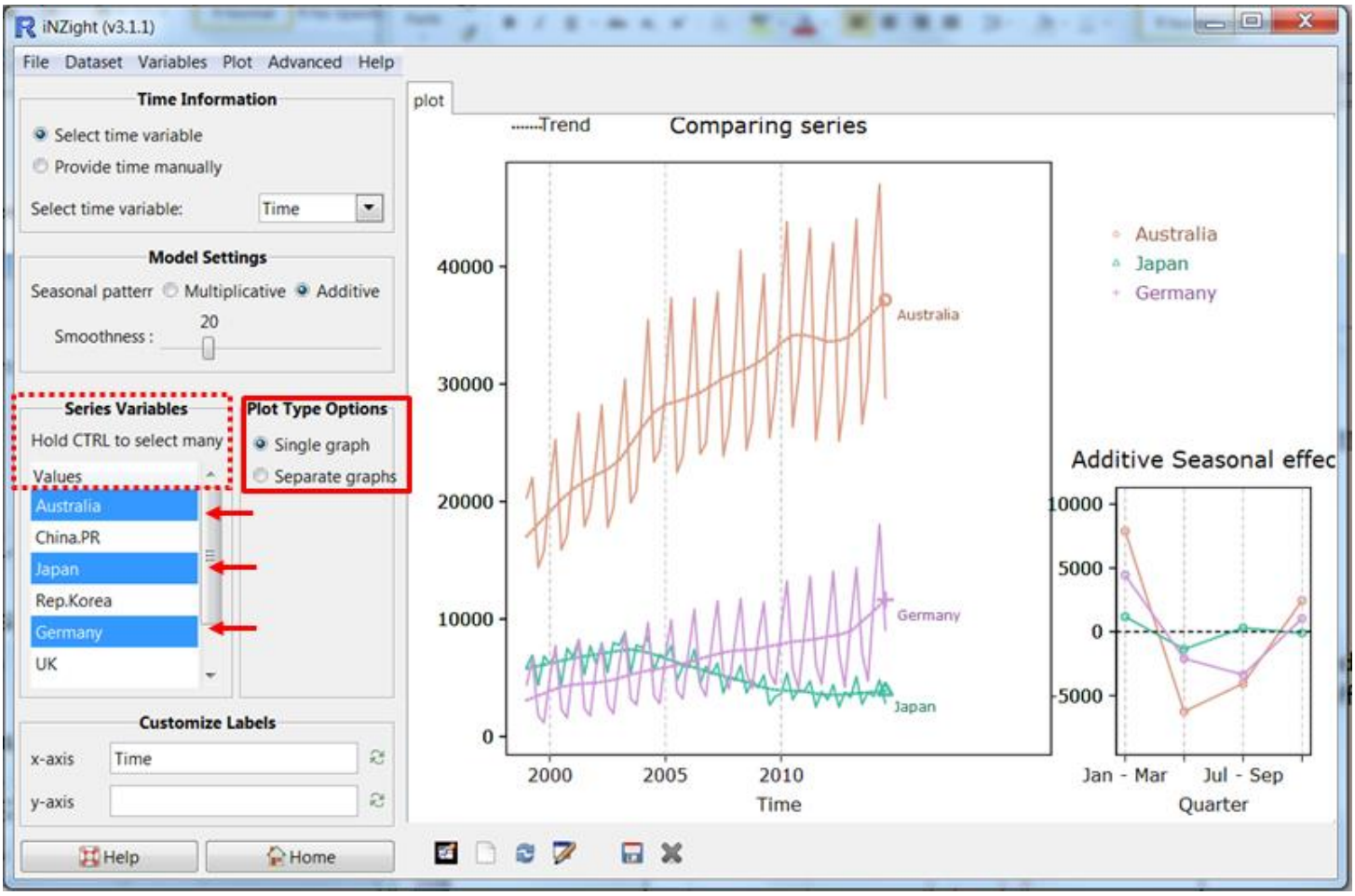
In the previous exercise we only looked at the visitors from one country alone. Now we want to see the graphs for more than one, to be able to compare their visitor numbers.

To do this we need the Time Series window again.

- Click **Advanced** in the top column
- Select **Time Series**.

Note that in **Select Variables** part of the command panel it tells us we can *select many values by holding down the* ***Ctrl*** *key* (*Cmd* on Mac) as we select. As soon as the second country is selected, the **Plot Type Options** section changes and offers us two options: ***Single graph*** or **Separate graphs**.

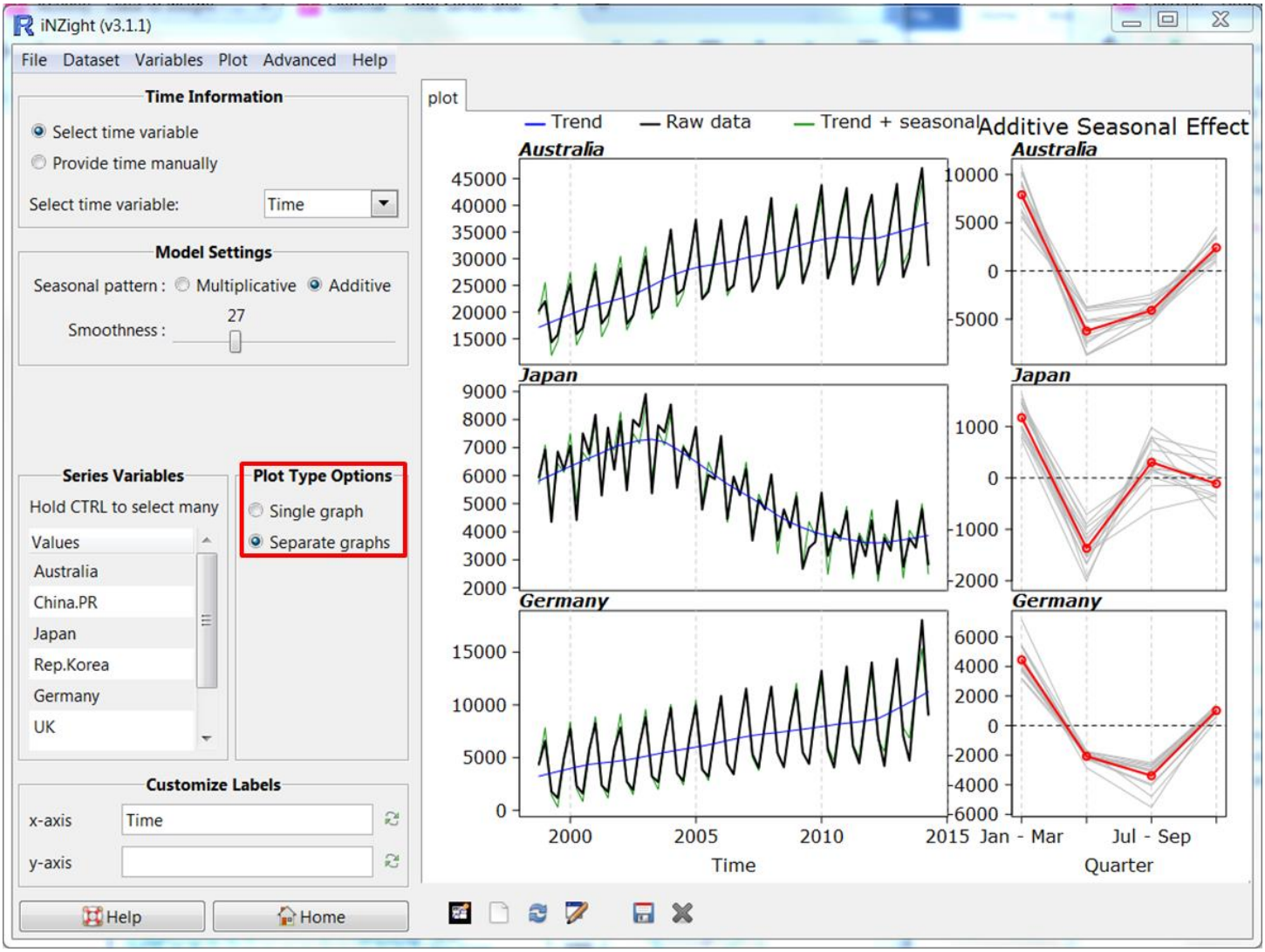
- The *default* option ***Single graph*** gives graphs like we see in the plot below.



All selected countries have been plotted against the same scale on the same graph.

Because ***Additive*** has been selected, on the right hand side we get the (average) **Additive Seasonal effects** for all selected countries.

- Now click ***Separate graphs.***

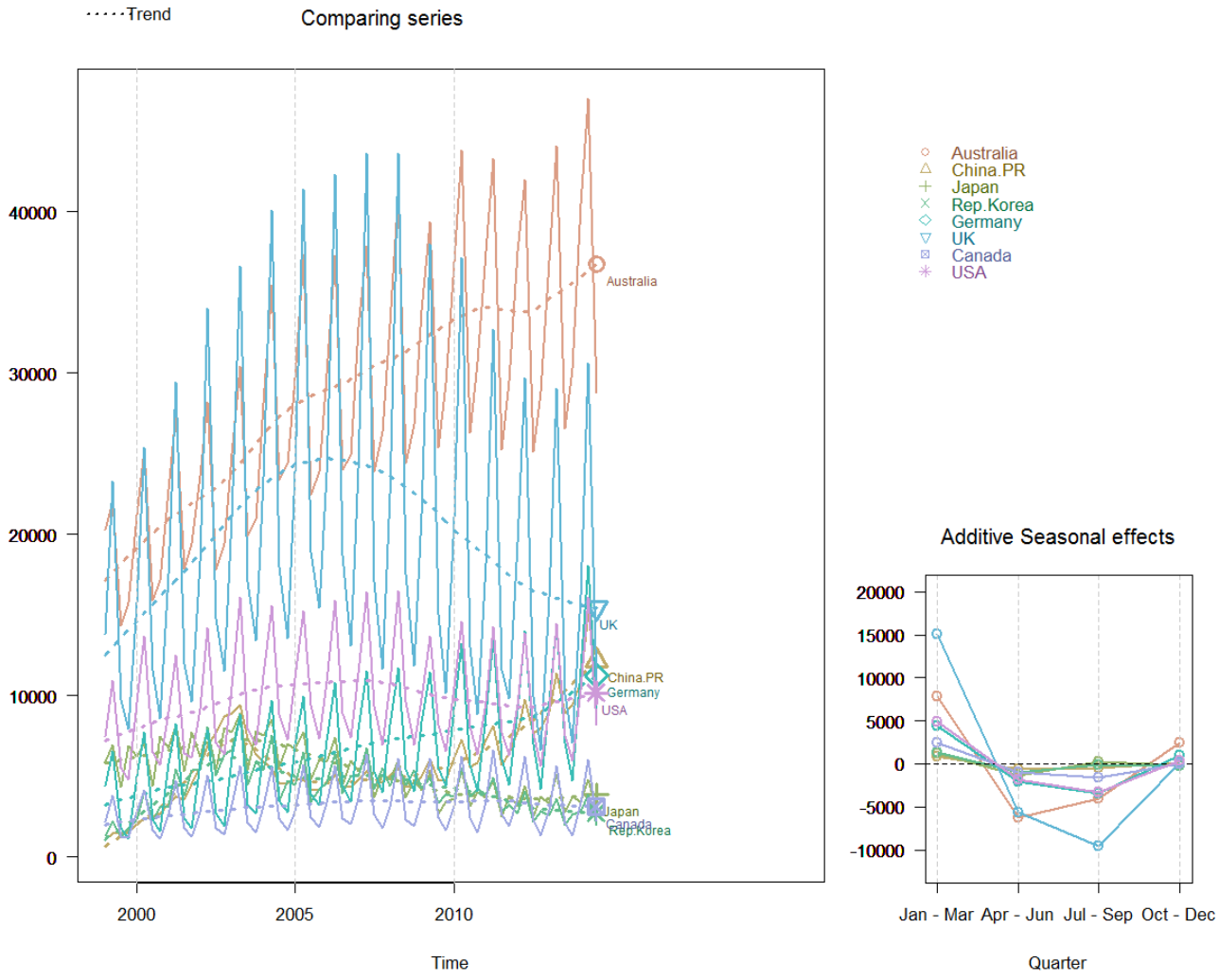


Each selected country gets its own set of graphs.

Trend+Seasonal swing is superimposed on the time series graph in green. (We can see the deficiencies of an additive model particularly for Australia and Germany.)

On the right-hand side we see all the individual seasonal effcts in grey and their average in red. As in the video the Japanese pattern is very different from the other two.

Let's select more countries (you can choose a bracket of countries all at once using the Shift key) and go back to the ***Single graph*** option.

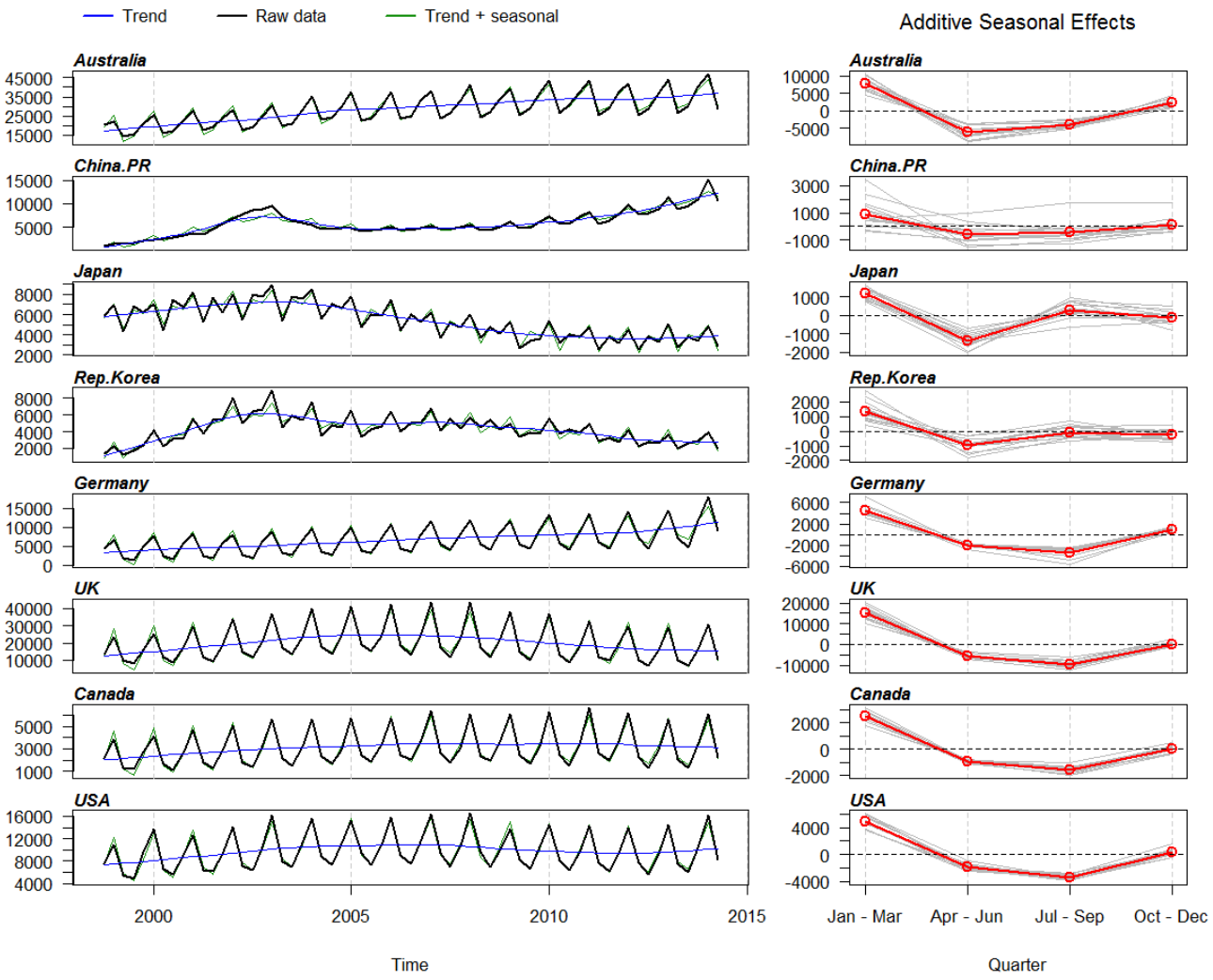


Even though the plot shows the graphs for all countries it is quite hard to make comparisons because the graphs are too close in the bottom part.

When the ***visitor arrival*** numbers were plotted in the video, the numbers from Australia were much bigger than those from anywhere else. Here with ***numbers of visitors currently in the country***, the Australian figures are similar to the UK (at least until 2008 when the UK numbers started going down after the Global Financial Crisis).

What do you think might account for these differences (Australian "visitor arrivals" numbers being much larger but "average visitor numbers in NZ" similar)?

- Now click ***Separate graphs*** …



Here all Time Series plots are separate and the approximation (Trend + Seasonal Swing) is also shown in green. On the right side you have the Additive Seasonal Effect for each year in grey and the average in red. If you have a problem with seeing the different lines it may help to enlarge the window.

Explore (~5min)

Use these two plot options to compare different sets of countries. (We have selected too many at once above.)

What similarities and differences do you see?

Post a comment if you discover anything interesting.