

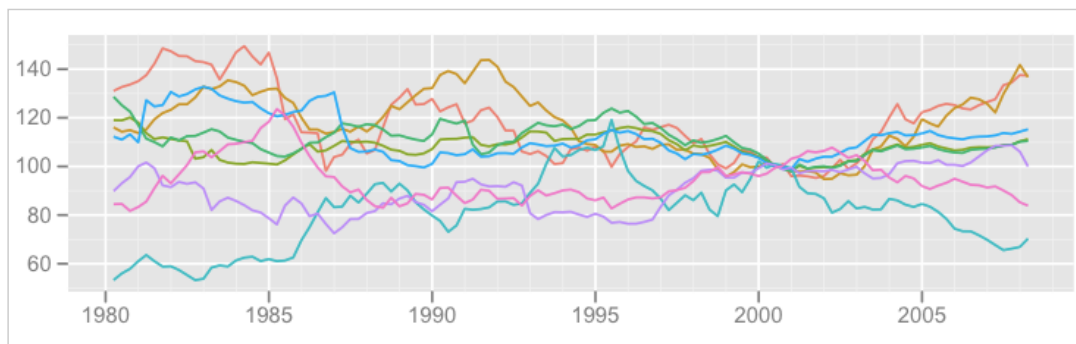
## the Tarzan

[R] + applied economics.

[About](#)
[ECNS 561](#)
[Nuts'n Bolts](#)
[Resources](#)

« TikZ diagrams with R: A Normal probability distribution function | R: apply() + function = no need for loops »

## TikZ diagrams with R: loops with tikzDevice



Recently I needed to create a lot of similar charts for input into a LaTeX document. In this post, I will show how I integrated the R package `tikzDevice` with `usepackage{tikz}` and a simple R loop to facilitate the task of creating tens (or hundreds) of publish-ready diagrams. For an introduction to using `tikzDevice`, see [this earlier post](#).

The approach I will use is as follows:

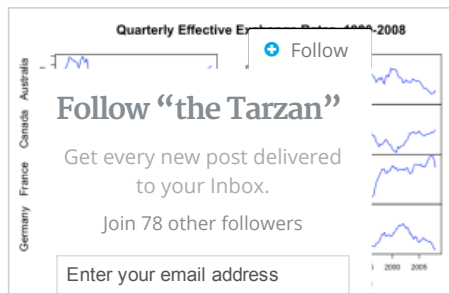
1. Create a plot in R.
2. Create a loop in R that will generate multiple diagrams for different subsets of my data.
3. Integrate `tikzDevice` with the loop to output diagrams as TikZ code in a .tex file in the directory of my LaTeX document.
4. Include the documents in my LaTeX file.

For this example, we'll be using the `panel.xls` data set from Walter Enders' [web site](#), showing quarterly values of the real effective exchange rates (CPI-based) for Australia, Canada, France, Germany, Japan, Netherlands, the United Kingdom and the USA between Q1 1980 and Q1 2008. For more commentary, see page 245 of his text "Applied Econometric Time Series", 3rd edition.

To quickly graph all the series together, we could do the following:

R:

```
1 # gdata helps read .xls files
2 require(gdata)
3 df = read.xls("http://cba.ua.edu/assets/docs/wenders/panel.xls", sheet = 1)
4
5 # a quick plot of all countries
6 df2 = ts(df, frequency = 4, start = c(1980, 1))
7 plot(df2[, -1], main = 'Quarterly Effective Exchange Rates, 1980-2008', col = 'blue')
```



Or, to create a chart similar to the one sho

the following:

```
1 # convert quarterly data into "l
2 df$date = as.Date(yearqtr(1980 +
3
4 # reshape is useful when using ggplot
5 require(reshape)
6 dfgg = melt(df, id.var = 'Date')
7 names(dfgg) = c('Date', 'Country', 'CPI')
8
9 # ggplot offers some nice looking charts
10 require(ggplot2)
11
12 # plot all time series on one chart, using different colors
13 ggplot(dfgg, aes(x=Date, y=CPI, group=Country)) + geom_line(aes(colour = Country))
```

Creating multiple images efficiently

However, the topic of this post is to create several images, and output them either (a) to a .tex file, or (b) to a bunch of different

## Search this blog

## Contributors



**Goulding** Kevin

## Categories

Econometrics  
Econometrics with R  
Numpy  
Python  
R tips & tricks  
Surviving Graduate  
Econometrics with R  
TikZ for Economists  
Visualizing Data with R  
White Papers

## Twitterfeed

RT @gappy3000: This post, apparently about #julialang and #pydata, explains why #rstats has become the standard of data analysis http:// ... 3 years ago

RT @justinwolffers: "If prediction markets are really as valuable as economists think, then...more experimentation could prove worthwhile. ... 3 years ago

RT @vsbuffalo: For me the biggest victory is for statistics and empiricism. Go Nate Silver and @fivethirtyeight for a brilliant forecast ... 3 years ago

Follow @baha\_kev

## Tag Cloud

cluster-robust  
Econometrics  
heteroskedasticity

LaTeX Numpy

Parallel Computing plots

Python R STATA  
tex TikZ

.jpg or .pdf files.

## Outputting .pdf files

Our goal will be to output a single .pdf file for each country.

```

1  i = 2
2  for (i in 2:ncol(df)) {
3
4  subs = NULL
5  subs = subset(df, select = c(1,i))
6
7  pdf(paste(names(subs)[2], '.pdf', sep=''), width = 7, height = 4)
8  plot(subs, type = 'l', col = 'blue', ylab = 'CPI', main = paste(names(subs)[2]))
9
10 dev.off()
11
12 }
```

## Outputting as TikZ code into single .tex file

Here is the simple way:

```

1  require(tikzDevice)
2  dev.new()
3
4  i = 2
5  tikz( 'CPI_by_countries.tex' )
6  for (i in 2:ncol(df)) {
7
8  subs = NULL
9  subs = subset(df, select = c(1,i))
10
11 plot(subs, type = 'l', col = 'blue', ylab = 'CPI', main = paste(names(subs)[2]))
12
13 }
14
15 dev.off()
```

Here is a bit more complex way that also puts each plot into its own figure, then gives each a caption and reference tag:

```

1  fn if(file.exists(fn)) file.remove(fn)
2
3  i = 2
4  for (i in 2:ncol(df)) {      #begin LOOP
5
6  subs = NULL
7  subs = subset(df, select = c(1,i))
8
9  cat("\\begin{figure}\\n", file = fn, append=TRUE)
10 sink(fn, append=TRUE)
11 tikz(console = TRUE)
12
13 plot(subs, type = 'l', col = 'blue', ylab = 'CPI', main = paste(names(subs)[2]))
14
15 dev.off()
16 sink()
17 cat(paste("\\caption{CPI - ", paste(names(subs)[2]), "}\\label{fig:",
18 paste(names(subs)[2]), "}\\n", sep=""), file = fn, append=TRUE)
19 cat("\\end{figure}\\n", file = fn, append=TRUE)
20
21 }      #end LOOP
```

Then, add the code `\include{CPI_by_countries}` to your LaTeX document, and make sure the .tex file is in the same folder. See [an earlier post](#) for more information on using R and LaTeX together.

About these ads

### You May Like



- 1. [14 Bathroom Inventions You Didn't Realize You Needed](#) 5 months ago [huffingtonpost.com](#) [Huffington Post](#) [HuffingtonPost.com \(AOL\)](#) [The](#)

Share this:



Be the first to like this.

#### Related

[TikZ diagrams with R: tikzDevice](#)


[TikZ diagrams with R: A Normal probability distribution function](#)

[Why use R? A grad student's 2 cents](#)

Posted on July 12, 2011 at 4:29 pm in [Visualizing Data with R](#) | [RSS feed](#) | [Reply](#) | [Trackback URL](#)

Tags: [LaTeX](#), [R](#), [TikZ](#)

2 Comments to “TikZ diagrams with R: loops with tikzDevice”




Cameron Bracken

July 13, 2011 at 3:16 pm

Nice post! Good overview of available output options.

Reply



Kevin Goulding

July 13, 2011 at 3:39 pm

Thanks Cameron! I'm clearly digging my R-LaTeX workflow right now.

Reply

Leave a Reply

Enter your comment here...

Tags

cluster-robust

econometrics

heteroskedasticity

latex

numpy

parallel computing

plots

python

r

stata

tex

tikz

Calendar

July 2011

M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
« Jun						Feb »

Archives

October 2012

February 2012

July 2011

June 2011

May 2011

Blogroll

Documentation

Plugins

Suggest Ideas

Support Forum

Themes

WordPress Blog

WordPress Planet