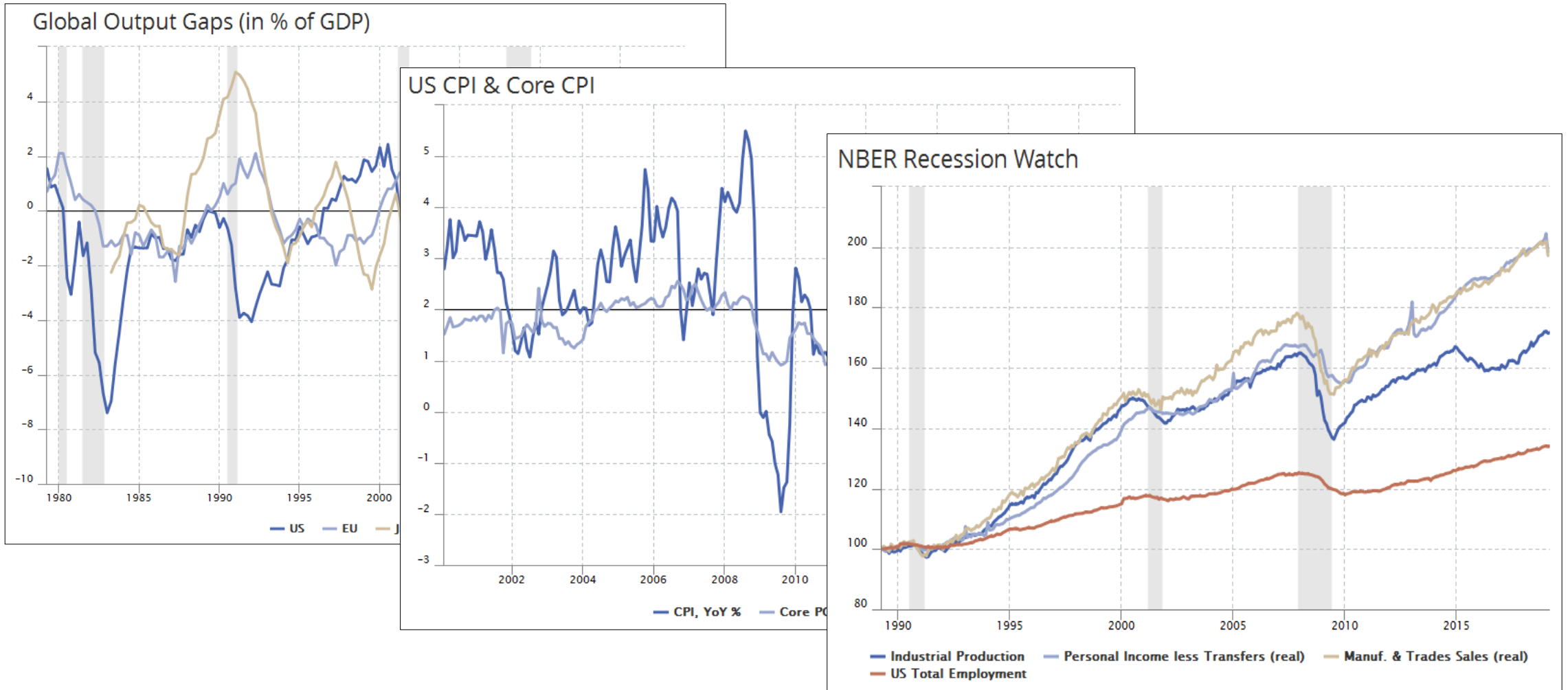# chartbookR

convenient chartbook creation

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Fixed Income Portfolio Manager

3 April 2019

"It's easy to lie with charts, but it's hard to tell the truth without them" – C. Wheelan

Global Output Gaps (in % of GDP)

US CPI & Core CPI

NBER Recession Watch

Plenty of (expensive) solutions out there

Bloomberg

Macrobond

THOMSON REUTERS
DATASTREAM

HAVER ANALYTICS®

THOMSON REUTERS
EIKON™

Source: Company websites, as of 30 March 2019

… and then there's R!

Complex charts require lots of code

US Budget Balance vs. Unemployment Rate

Recession shading

Reverse! Secondary y-axis

Source: US Treasury, Congressional Budget Office, Bloomberg, chartbookR, as of 15 March 2019
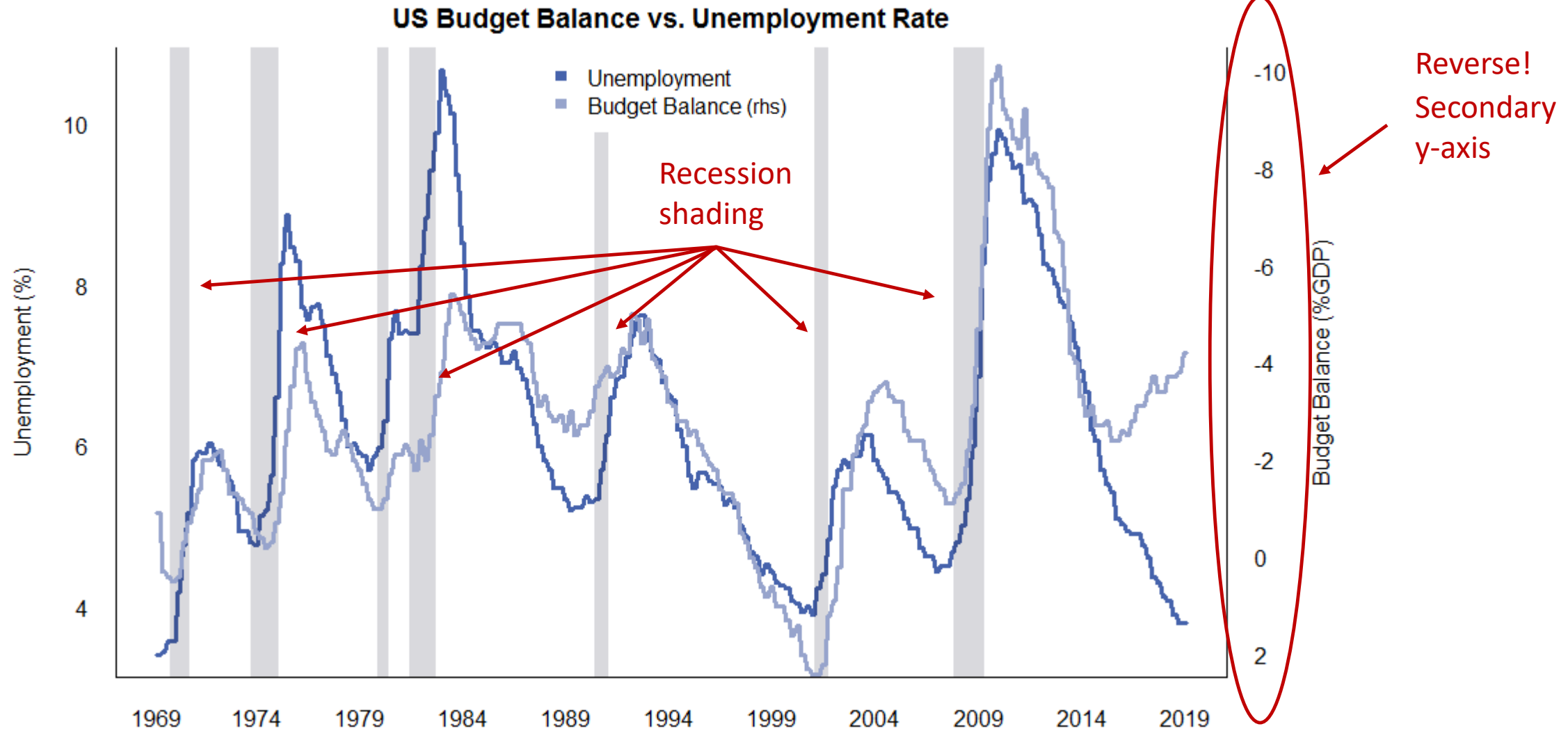
R data wrangling & plotting for one chart

```r
#Load libraries
library(zoo)
library(Rblpapi)

#Open Bloomberg connection
blpConnect()

#Set tickers, names, fields, dates
tickers <- c("EHUPUS Index", "EHBBUS Index")
names   <- c("Unemloyment", "Budget Balance (rhs)")
field   <- "PX_LAST"
start   <- as.Date("01/01/1969", "%d/%m/%Y")

#Download Bloomberg data
bbg <- bdh(securities = tickers, fields = field, start.date = start,
           include.non.trading.days = FALSE, options = NULL, overrides = NULL,
           verbose = FALSE, identity = NULL, con = defaultConnection(),
           int.as.double = getOption("blpIntAsDouble", FALSE))

#Convert to time series object & clean data
bbg_df  <- as.data.frame(bbg)
keep    <- c(1, seq(2, ncol(bbg_df), by = 2))
bbg_df  <- bbg_df[keep]
bbg_zoo <- read.zoo(bbg_df, format = "%Y-%m-%d")
colnames(bbg_zoo) <- names
```

```r
#Set color palette
palette(c("#4663AC", "#97A4CC", "#CEBC9A", "#BF7057", "#ADAFB2", "#E7C667"))

#Primary axis & content
par(mar = c(5, 5, 5, 5))
plot(bbg_zoo[,1], names.arg = format(index(bbg_zoo), "%b-%Y"),
     xlab = "", bty = "n", lwd = 3, col = 1, border = 0.1,
     space = 0, ylab = "Unemployment Rate, in %", cex.axis = 0.9,
     cex.lab = 1, las = 1); title(main = "US Budget vs. Unemployment Rate")

#Secondary axis & content
par(new = T)
plot(bbg_zoo[,2], plot.type = "m", bty = "n", ylim = rev(range(c(2, -10))),
     col = 2, axes = F, lwd = 3, ann = F)

mtext(side = 4, line = 3, cex = 1, "Budget Balance, in %")
axis(side = 4, cex.axis = 0.9, las = 2, tck = 0)

#Add legend & final grid
legend("topleft", bty = "n", legend = colnames(bbg_zoo), pch = 15, col = 1:2,
       ncol = 1)
box(which = "plot", bty = "u")

#Add footnote
title(sub = "Source: US Treasury, Congressional Budget Office, 18 March 2019",
      font.sub = 3, line = 3)
```

Source: Own code, as of 30 March 2019

The idea of chartbookR

To go from this...

... to this!

chartbookR principles

- Allow serial production of charts

- Modular set-up for all functions

- Automate data wrangling

- Minimize required user input

- Set useful defaults

- Correct wrong user inputs

- Retain customization flexibility

chartbookR functions & features

Function

Features

Data Download

| getBBG |

| getFRED |

- Bloomberg data
- FRED (St. L. Fed) data

Data Transformation

| Transform |

- Changes
- Moving Avg. / Sums
- Rebasing
- Z-Scores
- Lead/Lag

Visualization

| HiChart |

| LineChart |

| BarChart |

- Interactive Charts
- Recession Shading
- Area/Line Shading
- Secondary Axis
- Dynamic Data Labels

chartbookR on github & netlify (tutorial)

https://github.com/kilianreber

Applied Economic R-esearch
A blog maintained by Kilian Reber

Introduction to chartbookR

📅 10 Dec 2018, 00:00

🏷 chartbookR / Economic Analysis / Bloomberg / FRED

""Data scientists … spend from 50 percent to 80 percent of their time … collecting and preparing unruly digital data, before it can be explored for useful nuggets." (— New York Times). The chartbookR package allows the convenient creation of economic and financial data chartbooks. It handles most of the data wrangling and can thus create large chartbooks with few lines of short code. chartbookR consists of four types of functions:

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https://kilianreber.netlify.com/

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