

# Currency Exchange Rate Data

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## 1 Sources for exchange rate data

Exchange rates are a key source of uncertainty in international trade. They are therefore of interest to many, and there numerous sources of exchange rate data, of varying completeness and history.

We will mention a couple of the more convenient sources, and illustrate their use.

### 1.1 Currency pairs

A currency pair is the quotation of two different currencies, with the value of one currency being quoted against the other. The first listed currency of a currency pair is called the base currency, and the second currency is called the quote currency.

A currency quote compares the value of one currency to another—the base currency (or the first one) versus the second or the quote currency. The quote indicates how much of the quote currency is needed to purchase one unit of the base currency.

Currencies are identified by three-letter alphabetic codes. Well known examples: USD (U.S. Dollar), GBP (British Pound), EUR (Euro), NOK (Norwegian Crowns). When you want to pull exchange data, it is a matter of specifying the currency pair.

### 1.2 FRED

is the database of the St Louis Federal Reserve. They have relatively long time series of historical exchange rates, in many cases going back to the early seventies. For R users this is a convenient source, as the FRED data can be accessed using the `quantmod` library.

The following is an example of how to write a generic routine that accesses Fred data. To expand on this, look up the various exchange codes. A bit careful, though: Fred is not consistent with regards to the base currency, it is not always USD.

---

```
library(quantmod)
```

```
get_exchange_rate_from_fred <- function(cur){  
  ## selected currencies against the US dollar.  
  ## requires the code used by FRED, add to this for more currencies.  
  ## also careful, FRED changes quotation convention depending on currency  
  if (cur=="CAD"){ symb <- "DEXCAUS"  
  if (cur=="EUR"){ symb <- "DEXUSEU"  
  if (cur=="GBP"){ symb <- "DEXUSUK"  
  if (cur=="NOK"){ symb <- "DEXNOUS"  
  if (cur=="SEK"){ symb <- "DEXSDUS"  
  data <- getSymbols(symb,  
                    src="FRED",  
                    auto.assign=FALSE,
```

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```
        from=as.Date("1970-01-01"))
names(data) <- cur
return(data)
}
```

---

usage:

```
Sys.setlocale(category = "LC_ALL", locale = "C")

outdir <- "../results/2020_12_plot_exchange_rates/"
source("../2020_12_get_exchange_rates/get_exchange_rate_from_fred.R")

usd_nok <- get_exchange_rate_from_fred("NOK")

filename <- paste0(outdir,"plot_ts_USD_NOK.png")
png(filename,width=800,height=300)
plot.zoo(usd_nok,
         main="",
         ylab="USD/NOK",
         xlab="",
         col="royalblue",
         bty="n",
         las=1,
         lwd=c("2")
        )
box(bty="L")
dev.off()
```

produces plot:



### 1.3 Exchange rates from Yahoo

Yahoo finance also provides exchange rates. While they tend to be shorter periods than the Fred data, they are for many purposes more convenient, as they know about base currencies, and cross currencies.

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```
library(quantmod)

get_exchange_rate_from_yahoo <- function(cur1, cur2){
  ## read exchange rates from yahoo, close prices
  curr_com <- paste0(cur1, cur2, "=X") # currency pair
  data <- getSymbols(curr_com,
                    src="yahoo",
                    auto.assign=FALSE,
                    from=as.Date("1980-01-01"))
                                     # this date seem to be before all pairs first date,
                                     # but it could change
  exch_rate <- data[, 6]             # the close prices
  names(exch_rate) <-paste0(cur1, cur2)
  return(exch_rate)
}

get_exchange_rate_from_yahoo_ohlc <- function(cur1,cur2){
  ## read exchange rates from yahoo, including the open, high, low in addition to the close
  curr_com <- paste0(cur1,cur2,"=X") # currency pair
  data <- getSymbols(curr_com,
                    src="yahoo",
                    auto.assign=FALSE,
                    from=as.Date("1980-01-01"))
  exch_ohlc <- data[,1:4]
  names(exch_ohlc) <- c("open","high","low","close")
  return(exch_ohlc)
}
```

---

usage

```
Sys.setlocale(category = "LC_ALL", locale = "C")
outdir <- "../results/2020_12_plot_exchange_rates/"
source("../2020_12_get_exchange_rates/get_exchange_rate_from_yahoo.R")

gbp_nok <- get_exchange_rate_from_yahoo("GBP", "NOK")
filename <- paste0(outdir, "plot_ts_GBP_NOK.png")
png(filename, width=800, height=300)
plot.zoo(gbp_nok,
         main="",
         ylab="GBP/NOK",
         xlab="",
         col="royalblue",
         bty="n",
         las=1,
         lwd=c("2")
        )
box(bty="L")
dev.off()
```

produces plot

