REDA1-CE1000 Introduction to Real Estate Data Analytics
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Assignment 1

1. I have rerun the codes. Everything works according to the video lecture except for **Line 233**. Pasting this here just in case other students have a similar error.

See code snippet below:

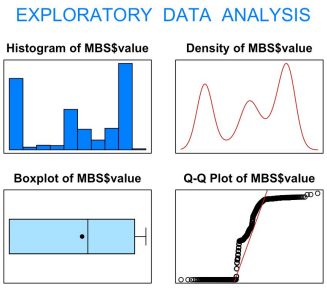
```
>d = read.csv("https://stats.idre.ucla.edu/stat/data/hsbraw.csv")

>Error in file(file, "rt") :

  cannot open the connection to 'https://stats.idre.ucla.edu/stat/data/hsbraw.csv'

In addition: Warning message:

In file(file, "rt") :

URL 'https://stats.idre.ucla.edu/stat/data/hsbraw.csv': status was 'SSL peer
certificate or SSH remote key was not OK'
```

2. After exploring St Louis's Currency in Circulation, 30-Year Fixed Rate Mortgage Average in the United States, and Mortgage-Backed Securities, I decided to investigate the "Assets: Securities Held Outright: Mortgage-Backed Securities" data from FRED.

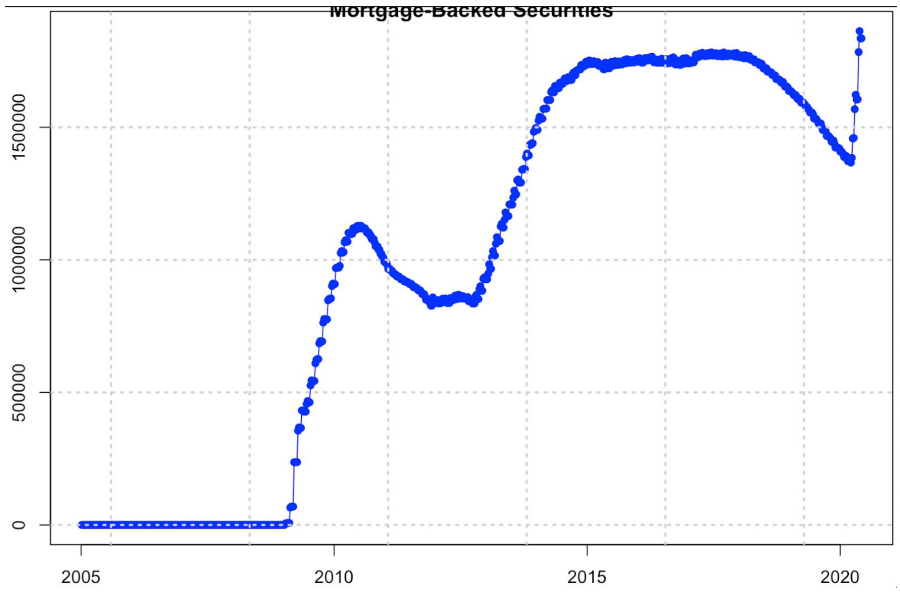
```
CIC = fredr(series_id = "MBCURRCIR", observation_start = as.Date("2000-01-01"))
plot(CIC$date, CIC$value, col = 'blue', pch=16, ylab = "Millions ($)",
     xlab = "Months", main=" Monetary Base; Currency in Circulation")
lines(CIC$date, CIC$value, col = "Blue")
#Notice a distinct uptick in 2020

MorAvg30 = fredr(series_id = "MORTGAGE30US", observation_start = as.Date("2005-01-01"))
plot(MorAvg30$date, MorAvg30$value, col = 'blue', pch=16, ylab = "Percent (%)",
     xlab = "Years", main="30-Year Fixed Rate Mortgage Average in the United States")
lines(MorAvg30$date, MorAvg30$value, col = "Blue")
#Look for data to investigate real estate loans on FRED: https://fred.stlouisfed.org/series/RELACBW027SBOG

#Plot data
#The current face value of mortgage-backed obligations held by Federal Reserve Banks. These securities are guar
MBS = fredr(series_id = "WSHOMCB", observation_start = as.Date("2005-01-01"))
```

I began by looking at the summary stats and an Exploratory Data Analysis plot. Although I am not familiar with MBS data, from the time series plot, I can see that prior to 2009, values are at 0. Due to this, I have chosen to begin my time series in 2010.

```
> str(MBS)
tibble [805 × 3] (S3: tbl_df/tbl/data.frame)
 $ date     : Date[1:805], format: "2005-01-05" "2005-01-12" ...
 $ series_id: chr [1:805] "WSHOMCB" "WSHOMCB" "WSHOMCB" "WSHOMCB" ...
 $ value    : num [1:805] 0 0 0 0 0 0 0 0 0 0 ...
> summary(MBS)
      date             series_id             value
 Min.   :2005-01-05   Length:805         Min.   :      0
 1st Qu.:2008-11-12   Class :character   1st Qu.:      0
 Median :2012-09-19   Mode  :character   Median :1071084
 Mean   :2012-09-19                      Mean   : 993003
 3rd Qu.:2016-07-27                      3rd Qu.:1709545
 Max.   :2020-06-03                      Max.   :1862841
```



At first glance, I can see that there has been an uptick in 2020 while the previous years have been on a steady decline indicating that prepayments/refinancing have occurred in the past.



There are two other points where we can see a noticeable increase. One of which belongs to the 2008 recession and another one in 2013. The increase in 2008 - 13 can be attributed to the Federal Reserve System's (Fed) decision to purchase MBS to help lower mortgage rates. The 2020 uptick is different as the Fed's decided to purchase MBS loans to help stabilize the market as reported by the Financial Times. Although this will not have immediate and direct impact to COVID, UBS reports that this liquidity should help with market sentiments.

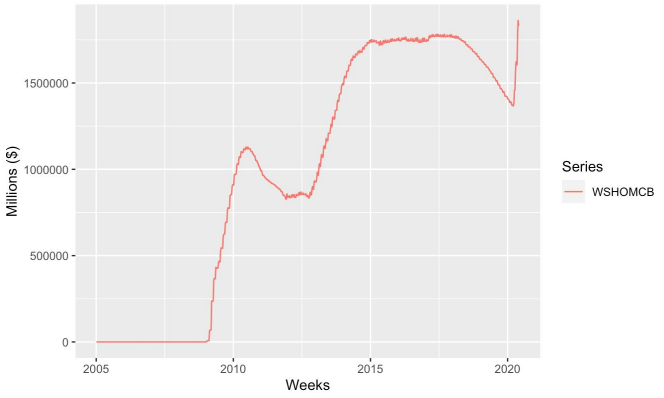
Research Resources:

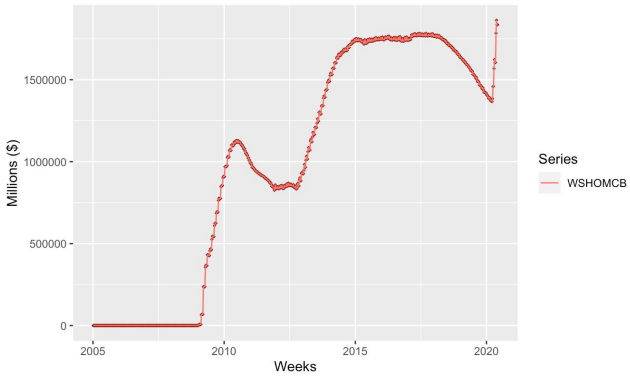
Current Face Value: https://www.investopedia.com/terms/c/current_face.asp

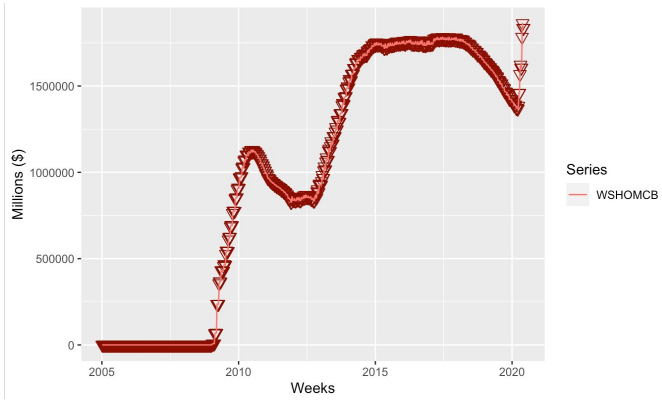
UBS The Fed buying MBS Again!
https://www.ubs.com/global/en/wealth-management/chief-investment-office/market-insights/house-view/daily/2020/the-fed-buying-mbs-again.html
Federal Reserve buys more mortgage bonds as rates rise above 4%
https://www.ft.com/content/ed6c48c6-6ae5-11ea-800d-da70cff6e4d3

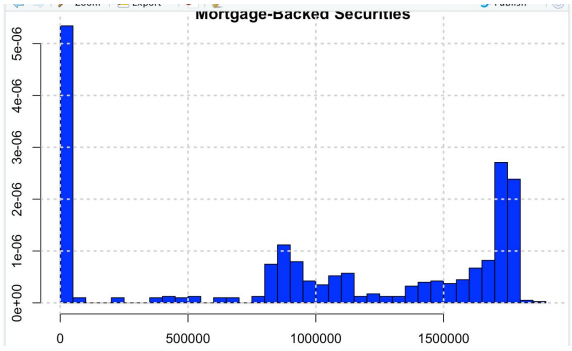
[See below for Other Charts Explored]:

Mortgage Backed Securities [plotted by ggplot,symbols,histogram]

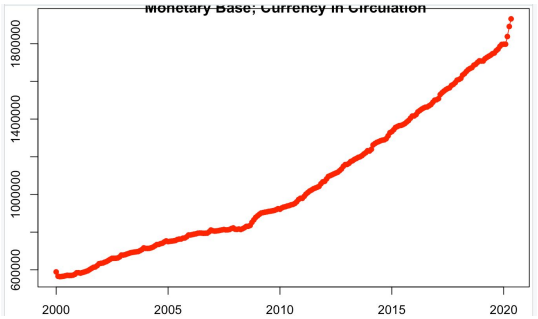








Currency in Circulation (St. Louis)



30-Year Fixed Rate Mortgage Average in the United States