IMPORTING AND MANAGING FINANCIAL DATA IN R

Welcome to the course

About me

- Author and/or maintainer of several packages
  - TTR, `xts`, `quantmod`, `quantstrat`, `blotter`
- R/Finance Conference Organizing Committee
- St Louis R User Group

What is `getSymbols()`?

- Provides access to multiple data sources
- Returns `xts` object by default
- Can import data two ways:
  - Return data like an ordinary function
  - Create an object like `load()` does in base R

getSymbols() example

```
> getSymbols(Symbols = "AAPL", src = "yahoo")
[1] "AAPL"

> getSymbols("AAPL")
[1] "AAPL"
```

```
> head(AAPL)
           AAPL.Open AAPL.High AAPL.Low AAPL.Close AAPL.Volume AAPL.Adjusted
2007-01-03     86.29     86.58    81.90      83.80   309579900      10.85709
2007-01-04     84.05     85.95    83.82      85.66   211815100      11.09807
2007-01-05     85.77     86.20    84.40      85.05   208685400      11.01904
2007-01-08     85.96     86.53    85.28      85.47   199276700      11.07345
2007-01-09     86.45     92.98    85.15      92.57   837324600      11.99333
2007-01-10     94.75     97.80    93.45      97.00   738220000      12.56728
```

`getSymbols()` data sources

- Yahoo! Finance
- Google Finance
- FRED
- Oanda
- CSV

Other `getSymbols()` data sources

- Yahoo! Finance Japan
- MySQL
- SQLite
- RData
- rds (created by `saveRDS()`)

getSymbols() example

Default

```
> # Load data like load()
> getSymbols("AAPL", auto.assign = TRUE)
[1] "AAPL"
> head(AAPL, n = 3)
           AAPL.Open AAPL.High AAPL.Low AAPL.Close AAPL.Volume AAPL.Adjusted
2007-01-03     86.29     86.58    81.90      83.80   309579900      10.85709
2007-01-04     84.05     85.95    83.82      85.66   211815100      11.09807
2007-01-05     85.77     86.20    84.40      85.05   208685400      11.01904
```

```
> # Return data like a normal function
> aapl <- getSymbols("AAPL", auto.assign = FALSE)
> head(aapl, n = 3)
           AAPL.Open AAPL.High AAPL.Low AAPL.Close AAPL.Volume AAPL.Adjusted
2007-01-03     86.29     86.58    81.90      83.80   309579900      10.85709
2007-01-04     84.05     85.95    83.82      85.66   211815100      11.09807
2007-01-05     85.77     86.20    84.40      85.05   208685400      11.01904
```

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Let’s practice!

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Introduction to Quandl

What is Quandl?

- **Data service:**
  - https://www.quandl.com/
- **R package:**
  - https://CRAN.R-project.org/package=Quandl
- **Function:**
  - `Quandl::Quandl()`

`Quandl()` versus `getSymbols()`

- Both provide access to multiple data sources
- `Quandl()` always returns data (i.e. does not behave like `load()`)

```
> # Instrument and source specified by Symbols and src arguments
> quantmod::getSymbols(Symbols = "DGS10", src = "FRED")

> # Instrument and source specified by code argument
> dgs10 <- Quandl::Quandl(code = "FRED/DGS10")
```

Quandl() versus getSymbols()

- `type` argument controls class of return object:
  - `"raw"` (`data.frame`), `"ts"`, `"zoo"`, `"xts"`, `"timeSeries"`

```
> # Return xts object instead of data.frame
> dgs10 <- Quandl::Quandl(code = "FRED/DGS10", type = "xts")
```

- Defaults:
  - `getSymbols()` returns `xts`
  - `Quandl()` returns `data.frame`

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Let’s practice!

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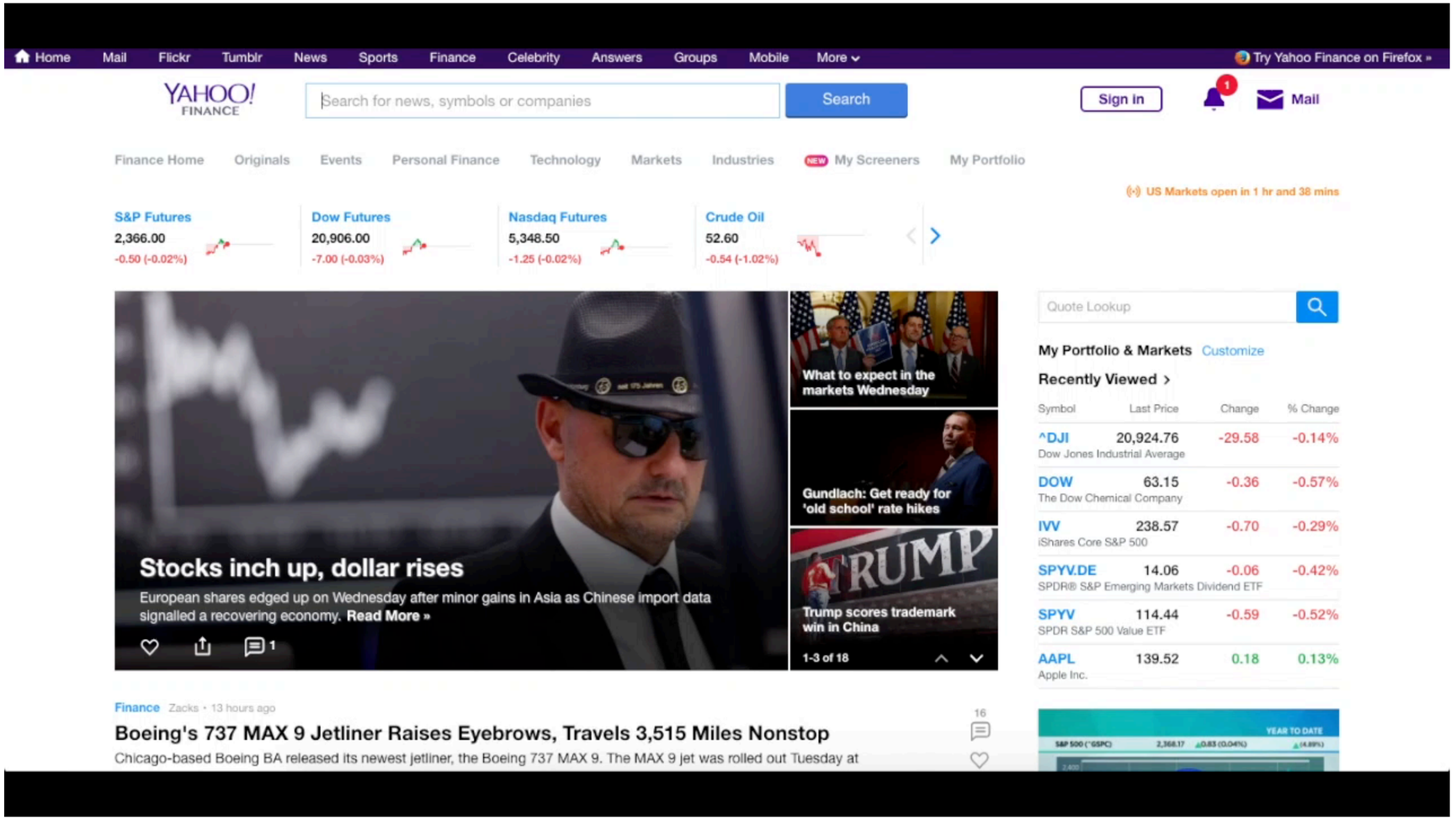
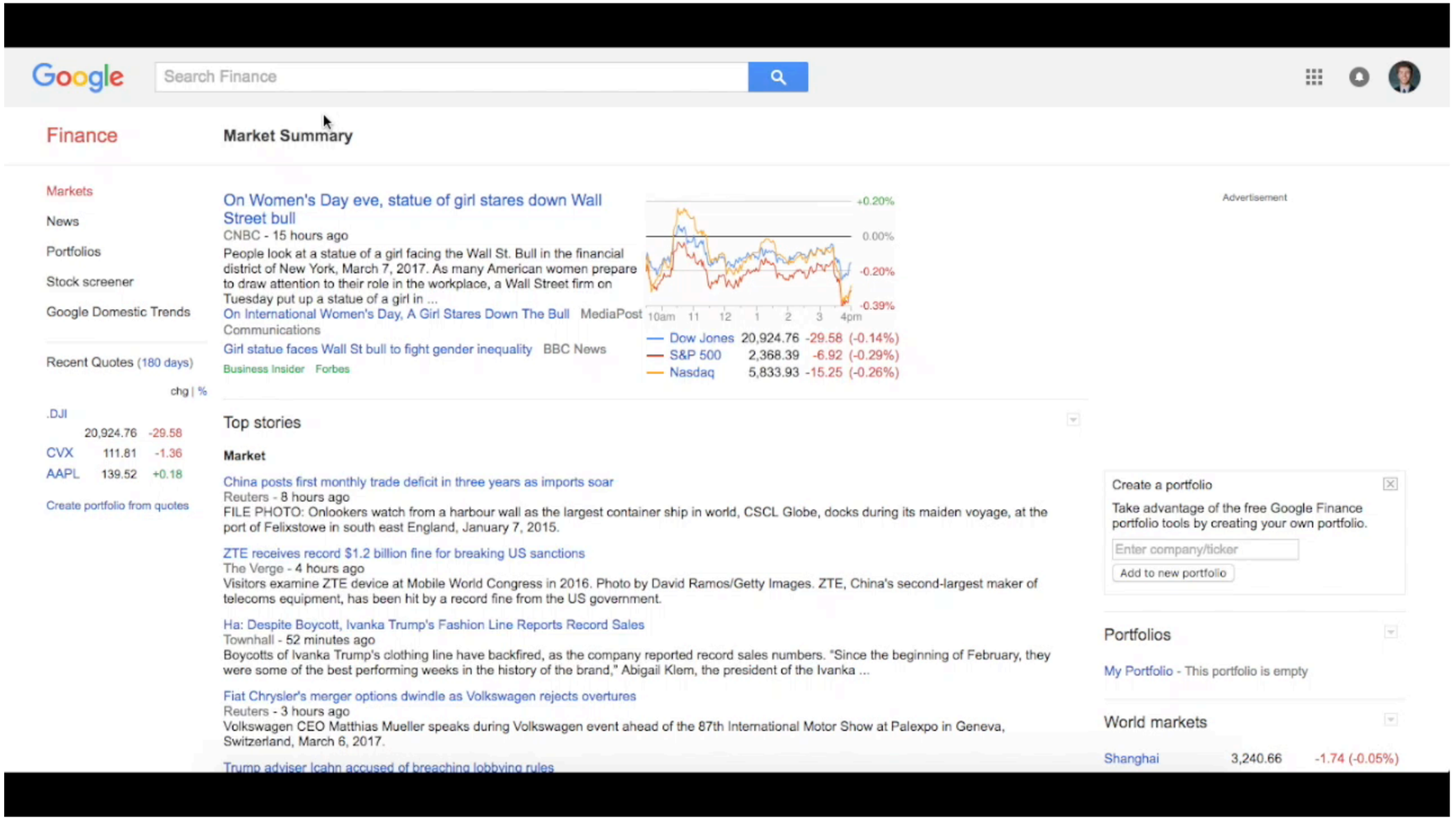
Finding data from internet sources

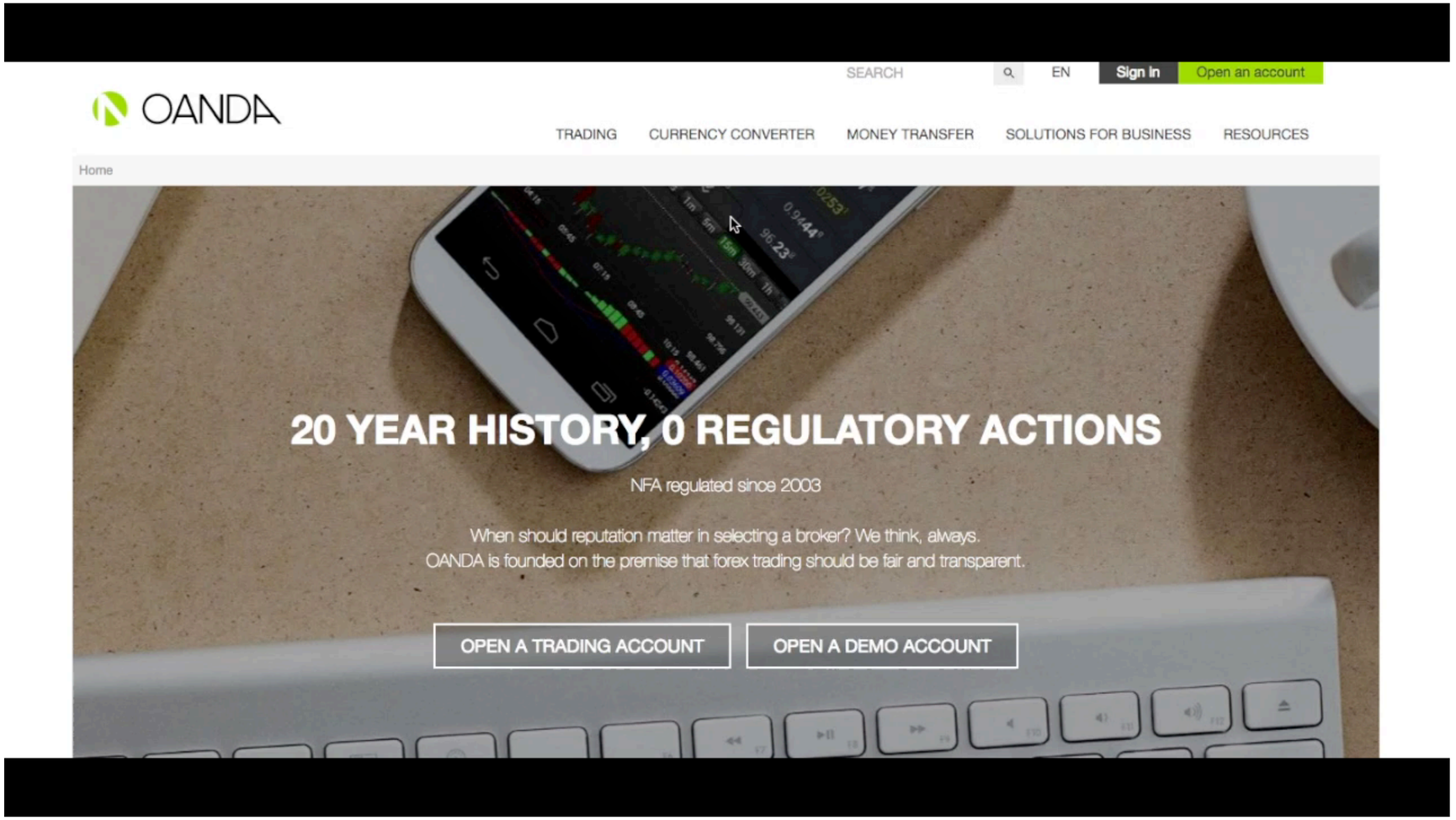
Yahoo Finance



Google Finance



Oanda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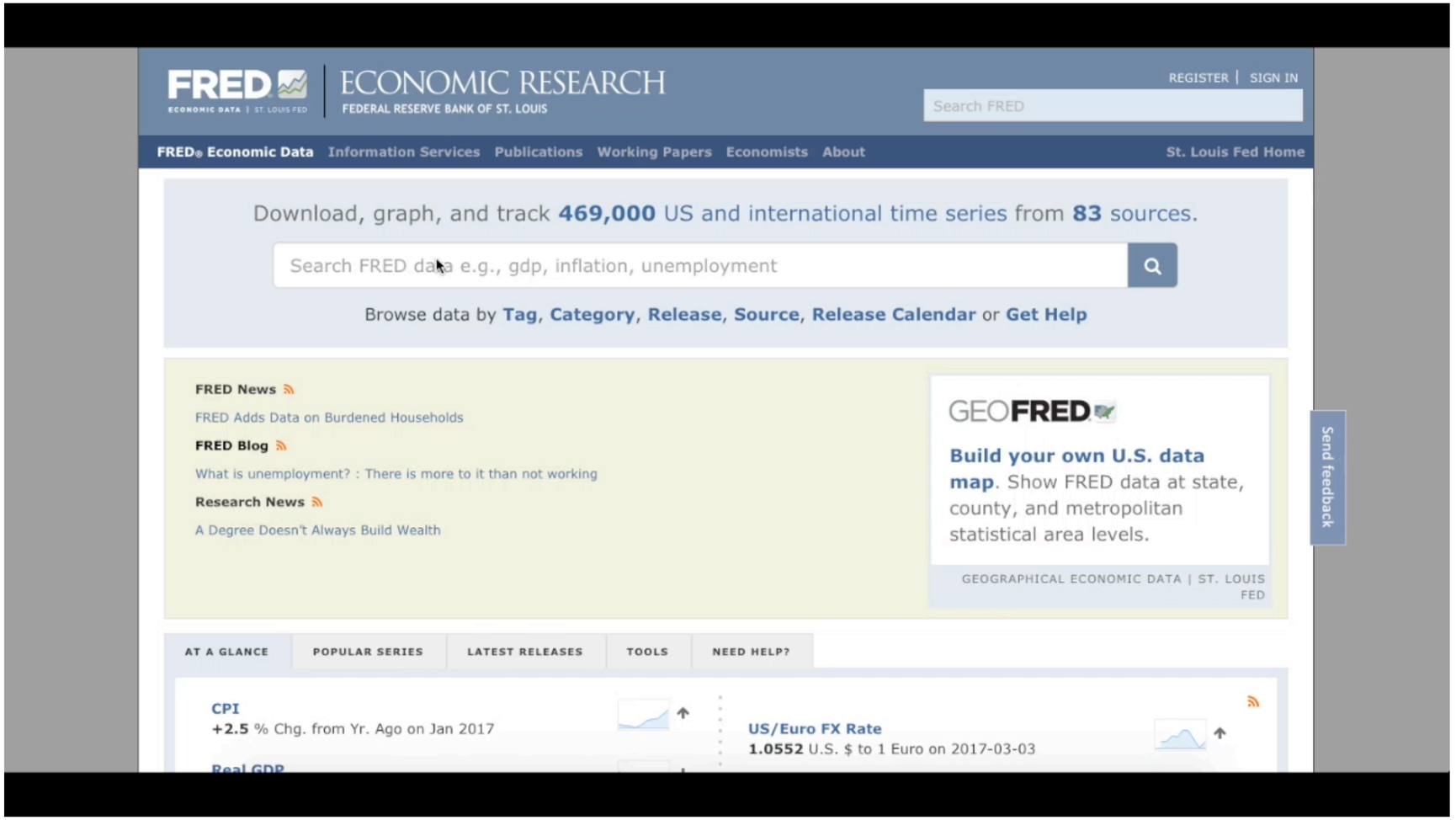
FRED


FRED
ECONOMIC DATA | ST. LOUIS FED
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LATEST RELEASES
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CPI
+2.5 % Chg. from Yr. Ago on Jan 2017
US/Euro FX Rate
1.0552 U.S. $ to 1 Euro on 2017-03-03
Real GDP

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