

Final Project User Guide

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DS-GA-1007: Programming for Data Science

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**Project Title:** Federal Open Market Committee (FOMC) Dashboard: Analyzing Financial and Economic Statistics Leading Up to an FOMC Meeting

### Objective of the Program

This program allows the user to see the status of various monthly economic indicators at the time of an FOMC meeting (2000-2015). Moreover, it allows the user to see how various daily financial market indicators have evolved between FOMC meetings.

This is important because the FOMC decision to either raise/lower/keep the short-term interest rates are influenced by the status of economic indicators and financial conditions.

The FOMC decides to raise/lower/keep unchanged the short-term interest rate to follow its “dual mandate” that was established by the Congress in the Federal Reserve Act. The dual mandate is for the FOMC to promote “maximum employment and stable prices.” In this context, I calculate the year-over-year (12 month growth rate) of prices (i.e. inflation) and estimate the unemployment rate and present the last available monthly data point to the user. Note that FOMC has generally aimed for core inflation (prices excluding food and energy) to be around 2% year over year. So measure above/below could prompt the FOMC to tighten/loosen monetary policy to better support “stable prices”. (Note that the last data point available differs depending on the data release schedule and as such I’ve created a function where it figures out which data points were available at the FOMC meeting).

In addition to the dual mandate, the FOMC keeps an eye on financial conditions as tighter/looser financial markets could hamper/support economic activity. As such, the program produces 6 charts (S&P 500 index, spot dollar index, 2-year, 5-year, 10-year, and 30-year treasury yields) which shows the evolution of these daily financial indicators between the FOMC meeting date the user selects and the previous FOMC meeting date.

Last, the outlook could have an impact on how the FOMC decides to change the short-term interest rate. For example, if the outlook for economic growth looks strong and inflation appears to be picking up, the FOMC may start to tighten monetary policy (raise short-term interest rates). In contrast, if the outlook looks less optimistic, the FOMC may leave short-term interests unchanged or reduce it to promote better economic activity. In this context, I also present the median 1-year ahead CPI inflation, unemployment rate, and GDP growth rate from the Survey of Professional Forecasters maintained by the Philadelphia Fed.

To sum up, once the user selects an FOMC meeting date, the program produces the last observed data point:

- Unemployment Rate
- Headline CPI Inflation (year-over-year)
- Core (excluding food and energy) CPI inflation (year-over-year)
- Headline PCE deflator (year-over-year) (This is an alternative measure of inflation)
- Core (excluding food and energy) PCE deflator (year-over-year)
- GDP growth rate
- The 4-quarter ahead median forecast for unemployment rate, CPI inflation and GDP
- The FOMC's decision on the Federal Funds rate (i.e. short-term interest rate)

Also, it produces charts of the daily financial indicators between FOMC meetings which includes:

- S&P 500 index
- Spot Dollar index
- 2-year Treasury Yield
- 5-year Treasury Yield
- 10-year Treasury Yield
- 30-year Treasury Yield

#### How to run the program

To run the program, store all modules and data files in one folder and run the Main\_Run.py python program. You will need access to the internet as some of the data comes from the St. Louis Fed database via Python's remote data access functions. Note that, after you produce the figure, the user will need to close the figure to continue to look at other dates. There were no special functions, classes, or dependencies required to run the program.

#### Input to program

The program takes the user's desired FOMC meeting date as an input.

#### Output

As the user puts in different FOMC meeting dates, the program will output in the terminal the economic statistics that are stated above. Additionally, a figure of the financial indicators will be produced and saved as a PDF.

#### Data sources

- St.Louis Fed's FRED database
- Philadelphia Fed's Survey of professional forecasters (<http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/>)
- Bureau of Economic Analysis
- Bureau of Labor Statistics

- Federal Reserve Board
- Bloomberg

List of data files

Filename	Description	Source
CPI.csv	Contains the data reference month and data release date for the CPI	Bloomberg
DXY.csv	The dollar spot index	Bloomberg
FOMC.csv	The FOMC meeting date, the fed funds rate and the change in the fed funds rate from the prior meeting.	Federal Reserve Board
GDP.csv	GDP and the reference quarter and release date	Bureau of Economic Analysis
Median_CPI_Level.xls	The median CPI inflation rate of the survey of professional forecasters	Philadelphia Fed
Median_RGDP_Level.xls	The median real GDP of the survey of professional forecasters	Philadelphia Fed
Median_UNEMP_Level.xls	The median unemployment rate of the survey of professional forecasters	Philadelphia Fed
PCE.csv	Contains the data reference month and data release dates for the PCE	Bureau of Economic Analysis
SP500.csv	The daily S&P 500 index closing price	Bloomberg
TSY2YR.csv	The daily 2-year Treasury yield closing price	Bloomberg
TSY5YR.csv	The daily 5-year Treasury yield closing price	Bloomberg
TSY10YR.csv	The daily 10-year Treasury yield closing price	Bloomberg
TSY30YR.csv	The daily 30-year Treasury yield closing price	Bloomberg
Urate.csv	The unemployment rate release dates and reference months	Bureau of Labor Statistics
FRED: unemployment data	We pull the number of unemployed and the labor force to calculate the monthly unemployment rate	St. Louis Fed
FRED: CPI index	With the CPI, we calculate the 12-month growth rate of prices	St. Louis Fed
FRED: core CPI index	Same as above	St. Louis Fed
FRED: PCE deflator index	Same as above	St. Louis Fed
FRED: core PCE deflator index	Same as above	St. Louis Fed

### List of Python Files

Python File Name	Short Description	Dependencies
CalcEconStats.py	Pulls in economic data from FRED database and calculates the necessary econ stats.	LoadRawData.py
CalcForecastStats.py	Loads the SPF data and calculates the necessary 4-quarter ahead stats	LoadRawData.py
GetFOMCDate.py	Takes the user input FOMC meeting date and figures out the previous FOMC meeting date	None
GetStatByDate.py	Grabs the last reported econ statistic	
__init__.py	Null	None
LoadAllData.py	Pulls in all the necessary economic data from csv, xls, and FRED database	CalcEconStats.py CalcForecastStats.py LoadRawData.py GetStatbyDate.py LoadEconData.py LoadFinancialData.py
LoadEconData.py	Loads the GDP and FOMC data sets	LoadRawData.py
LoadEconStatDates.py	Load the reference dates and release dates of CPI, PCE and unemployment rate	LoadRawData.py
LoadFinancialData.py	Loads the daily financial data	LoadRawData.py
LoadRawData.py	The main functions to pull in the data files and make them pandas dataframe	None
Main_Run.py	Main file to run the program	All
PlotFinancialData.py	Retrieves the financial data and selects the correct time period to analyze and plots the data	None
SelectFOMCMtgDate.py	Guides the user to select the correct FOMC date	None
Unittest_FinalProject.py	Makes sure all the necessary files exist	None