Plotting Time Series

Dr. Patrick Toche

References:

Christoph Hanck, Martin Arnold, Alexander Gerber, and Martin Schmelzer, *Introduction to Econometrics with R*, University of Duisburg-Essen, Essen, Germany.
https://www.econometrics-with-r.org/

Winston Chang, *Cookbook for R*, O'Reilly Media,
http://www.cookbook-r.com/

Hadley Wickham and Garrett Grolemund, *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*, O'Reilly Media,
https://r4ds.had.co.nz/

Hadley Wickham, *Advanced R*, CRC Press,
https://adv-r.hadley.nz/

Time Series Plots

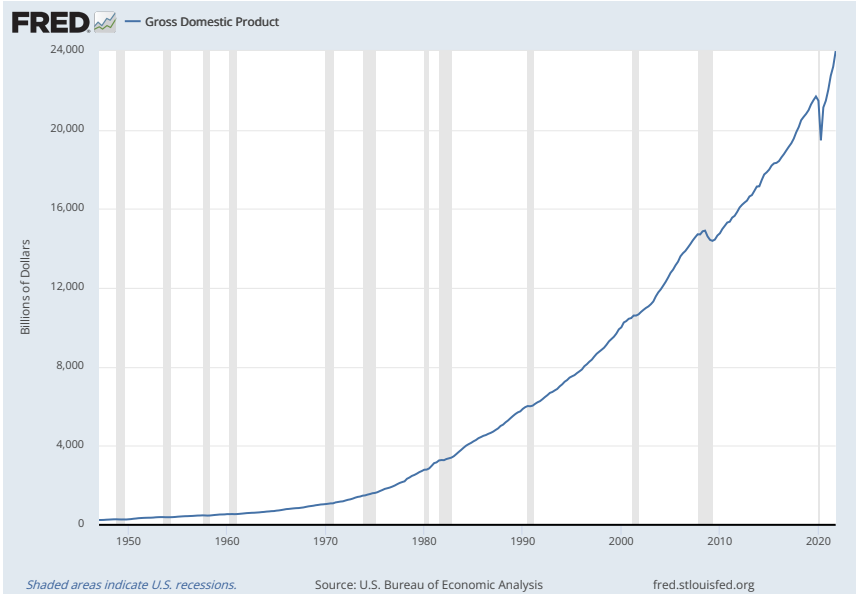
Get quarterly data on the GDP for the United States, going back to 1960 and up to the latest available observation.

- Make a time series plot of both nominal and real GDP for the years 1970-1979, with both series normalized to start at the same value in 1970. Use a logarithmic scale.
- Compute the growth rate for each quarter. Compute the annualized growth rate for each quarter. Plot the two series on the same axes.

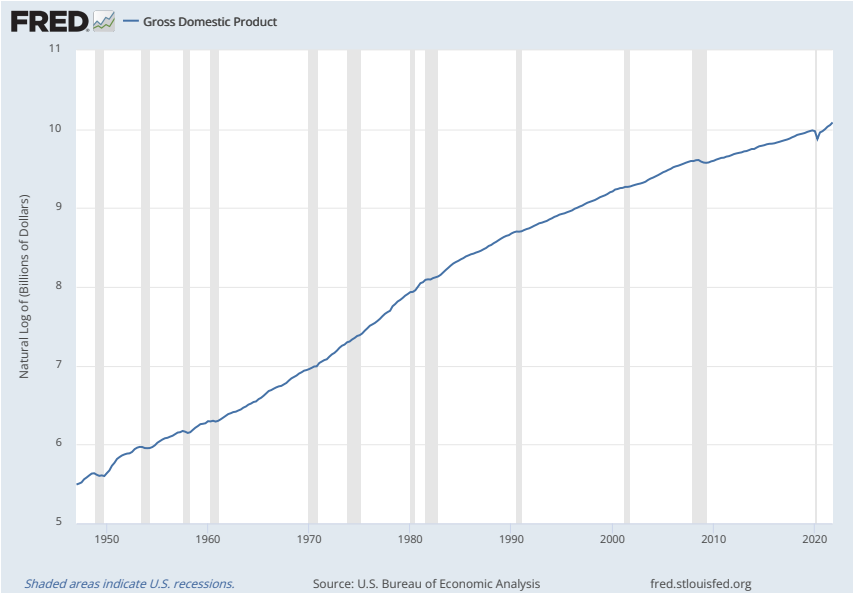
Basic Plots

FRED

Plot by FRED: Linear

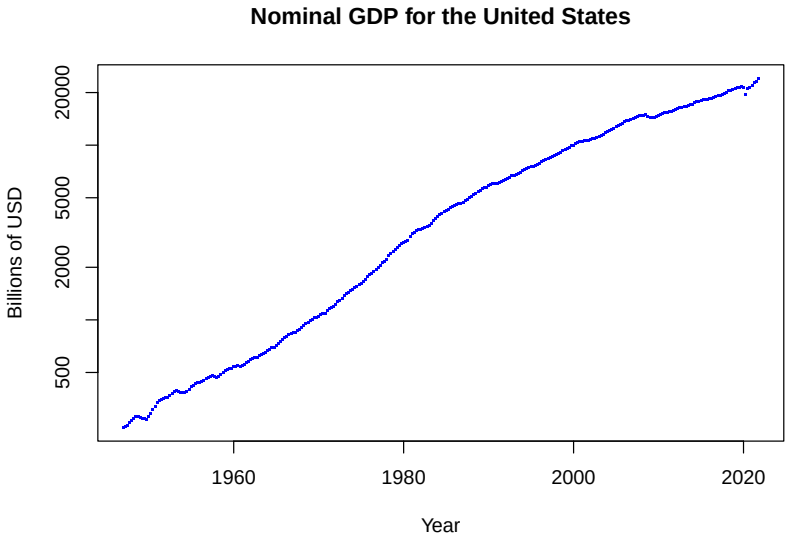


Plot by FRED: Logscale



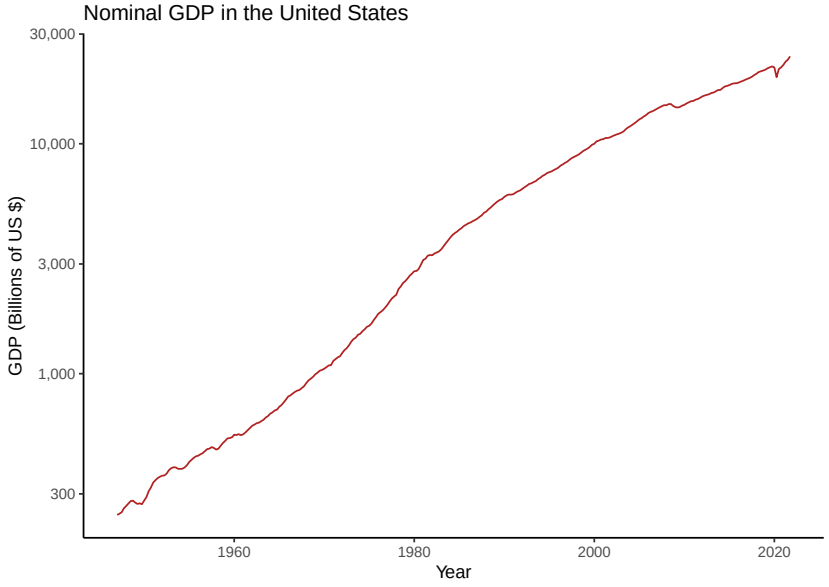
Base-R

Plot with Base-R: Logscale

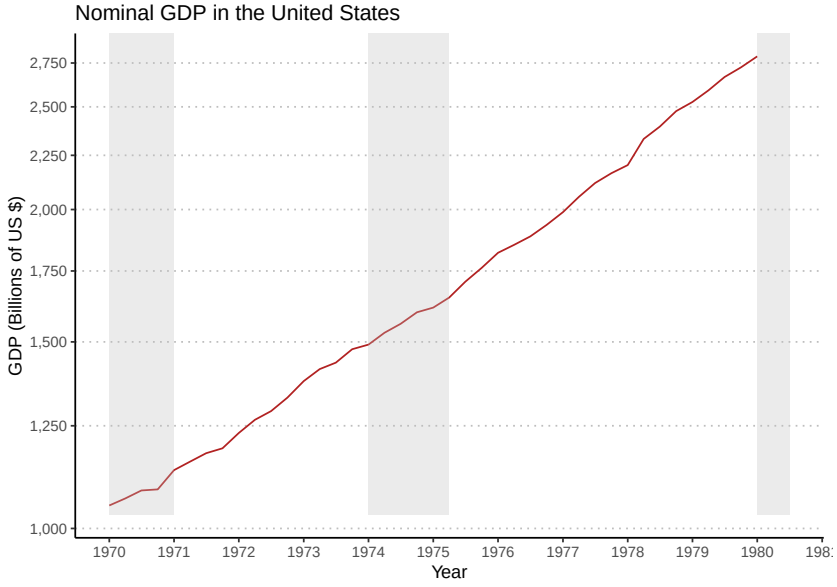


ggplot2

Plot with ggplot2: Logscale

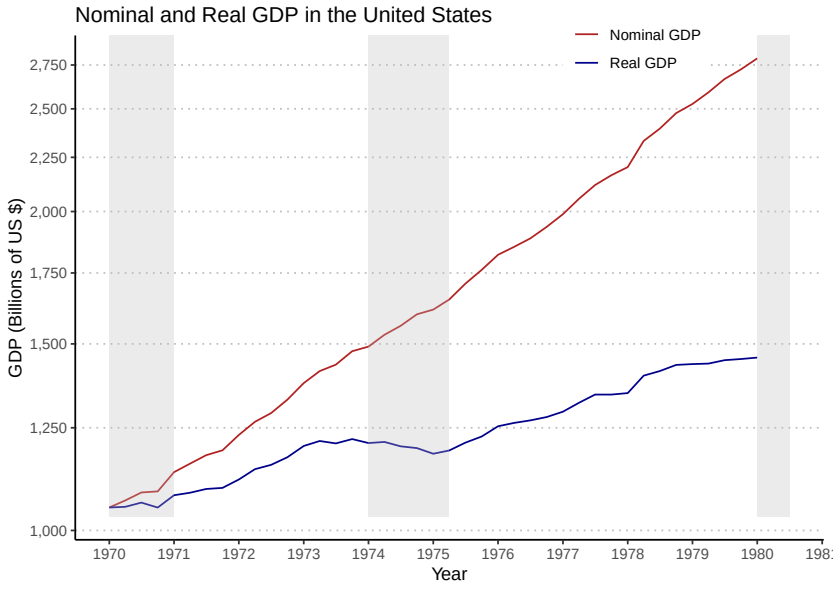


Plot with ggplot2: Logscale & Recessions



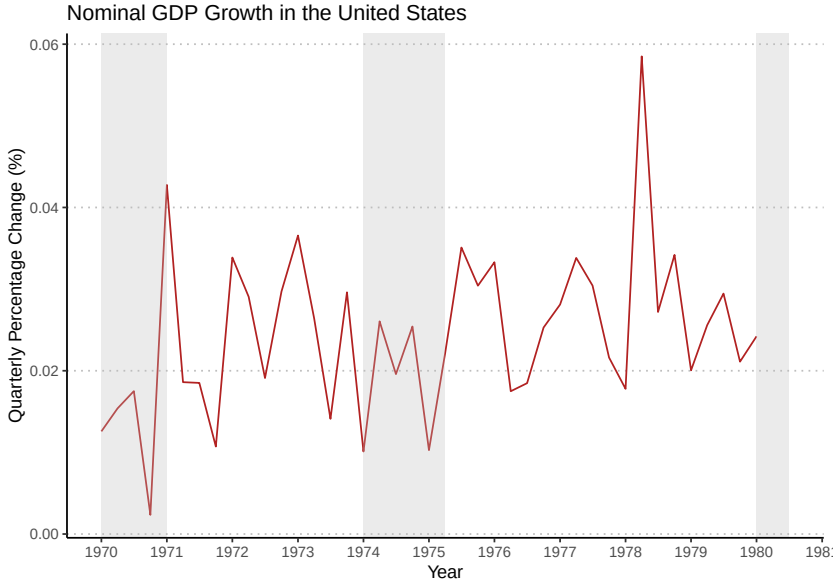
Real Vs Nominal

Real Vs Nominal GDP

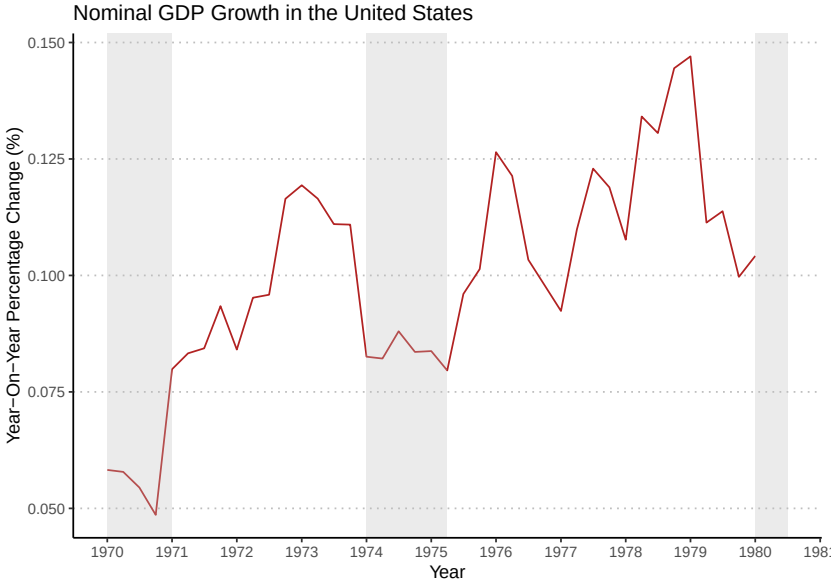


Growth Rates

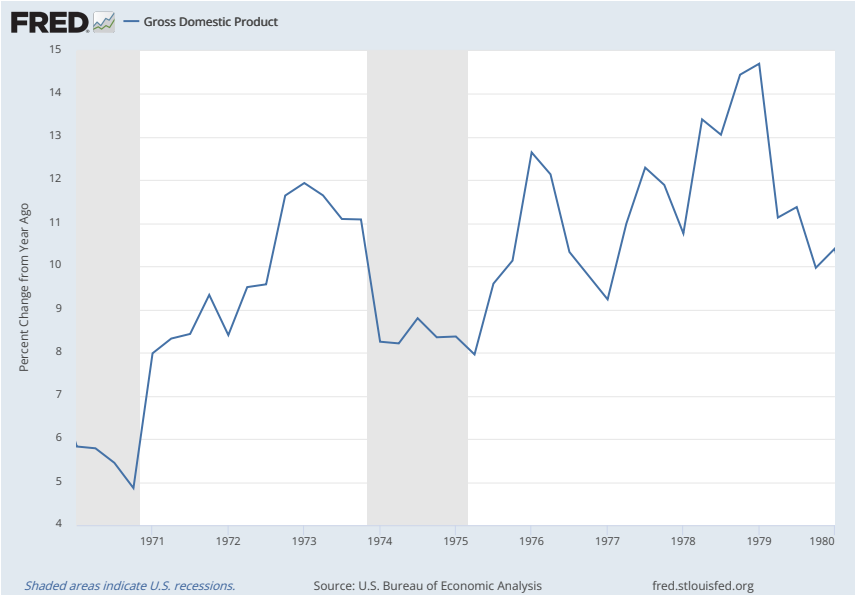
Quarterly Growth



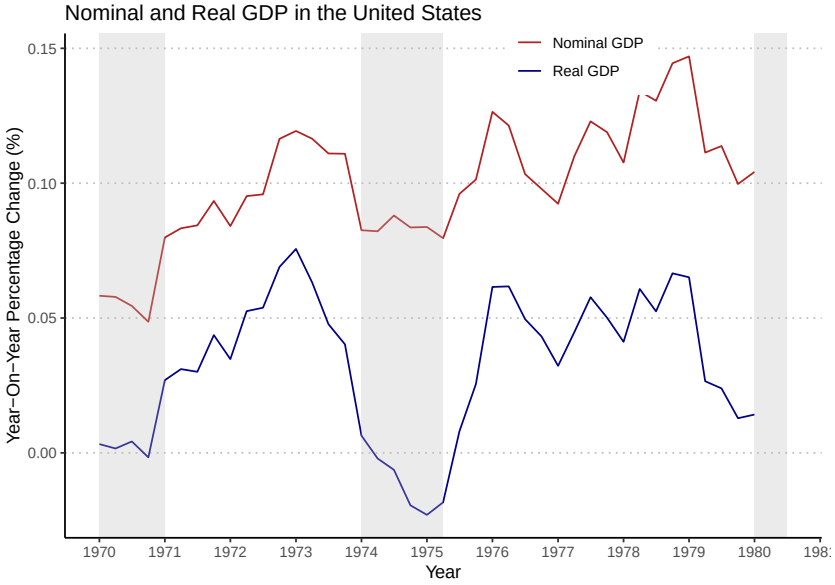
Year-On-Year Growth



Year-On-Year Growth: Plot by FRED

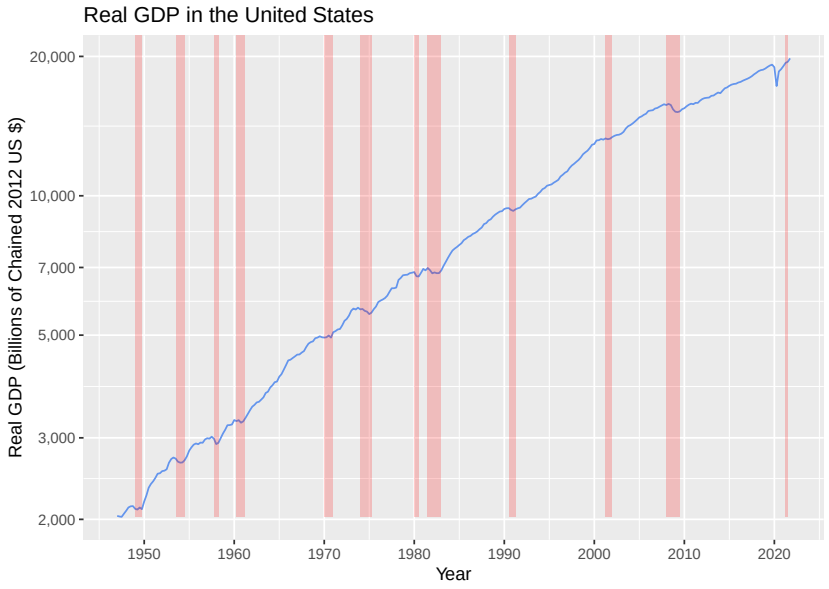


Year-On-Year Growth: Real Vs Nominal

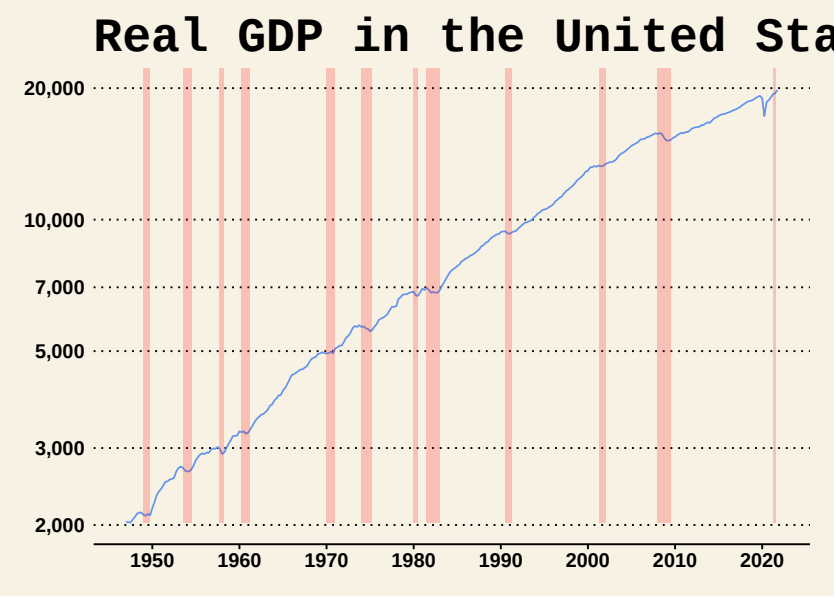


Plot Themes

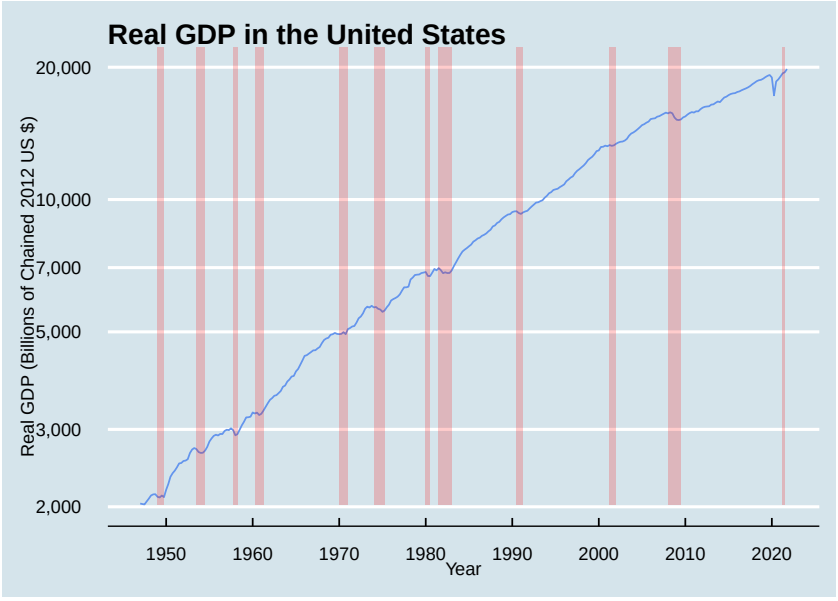
Gray Look


Real GDP in the United States
Real GDP (Billions of Chained 2012 US $)
20,000
10,000
7,000
5,000
3,000
2,000
1950
1960
1970
1980
1990
2000
2010
2020
Year

WSJ Look


Real GDP in the United Sta
20,000
10,000
7,000
5,000
3,000
2,000
1950
1960
1970
1980
1990
2000
2010
2020

Economist Look



FiveThirtyEight Look