

----- ONLINE DATA APPENDIX -----
Low-Frequency Analysis of Economic Time Series
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October 2019
(This draft: September 8, 2020)

The following data series are used in the chapter:

- Total Factor Productivity for the U.S.: Data are from John Fernald.¹ We use his **quarterly_tfp.xlsx** file dated September 5, 2019. (We use his **dtfp** series.)
- Nominal values of GDP, consumption, investment, and labor compensation are from FRED and, using the FRED labels, are **GDP** (Gross domestic product), **PCEC** (Personal consumption expenditures), **GPDI** (Gross private domestic investment), and **COE** (National Income: Compensation of Employees, Paid).
 - These values are deflated by **GDPCTPI** (Gross Domestic Product: Chain-type Price Index).
 - The growth rates in these series are converted to per-capita terms using the trend value of the growth rate **CNP160V** (Population level from the CPS). The trend is computed using the low-frequency trend with $q = 12$.
 - These transformations are internally documented in **hoe_data_input.m**.
- The real exchange rate is an extended version of the Lothian-Taylor (1996) series constructed in Dou and Müller (2020).
- The unemployment rate is from FRED, series label **unrate**.
- The realized volatility series is from the Oxford-Man Institute of Quantitative Finance, realized volatility library. We use the logarithm the **rk_parzen** (the realized kernel variance (Parzen)).²

¹ John Fernald. 2014. “A Quarterly, Utilization-Adjusted Series on Total Factor Productivity” Federal Reserve Bank of San Francisco Working Paper 2012-19.

² We thank Tim Bollerslev for his advice on data sources.