Data and Code Archive for *Reassessing the Predictive Power of the Yield Spread for Recessions in the United States*

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1 Data

This archive contains six Excel files which store the data.

1.1 Real Time Output

The file **routputMvQd_downloaded22Apr2024.xlsx** contains the real-time Real GNP/GDP ($ROUTPUT$) data from the Federal Reserve Bank of Philadelphia. It was downloaded on April 22nd, 2024 from https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/routput .

The file **routputMvQd.xlsx** is a version of the previous file with data before 1953Q2 removed and missing values imputed as follows:

- Observations for 1953Q2 to 1958Q4 are missing for vintages from 1991M12 to 1992M12 inclusive. These are inferred by applying the growth rates from the 1991M11 vintage backwards from 1959Q1. For example, the entry for 1958Q4 for the 1991M12 vintage is calculated as $1909.7 \times (1586.7/1606.4) = 1886.3$. These entries are displayed in red.
- With one exception, mid-quarter vintages generally include the first release of the previous quarter's data for $ROUTPUT$. We use these vintages when constructing the advance data measure of the $R1$ recession indicator used in the online appendix. The one exception is the February 1996 vintage, which does not include the first release for 1995Q4. For this vintage, we set the 1995Q4 observation equal to the 1995Q3 value. This observation is displayed in blue.
- The 2003M12 vintage does not report an observation for 2003Q3, but the 2003M11 vintage does. We use the growth rate from the 2003M11 vintage between 2002Q2 and 2002Q3 to infer a value for 2003Q3 for the 2003M12 vintage. This observation is displayed in green.

1.2 Yield Spread and Final Vintage National Financial Conditions Index

The file **FRED.xlsx** contains the 3-Month Treasury Bill Rate ($TB3MS$), the 10-year Treasury Bond rate ($GS10$) and the final vintage NFCI ($NFCI$). It was downloaded from FRED at the Federal Reserve Bank of St Louis website, https://fred.stlouisfed.org/ on April 22, 2024.

1.3 Real Time National Financial Conditions Index

The file **NFCI_vintages.xlsx** contains the real-time vintages of the NFCI. It was downloaded from Michael McCracken's website, https://research.stlouisfed.org/econ/mccracken/sel/ on April 22nd, 2024.

1.4 Survey of Professional Forecasters

The file **Mean_RECESS_Level_downloaded22Apr2024.xlsx** contains the mean responses for the probability of a decline in the level of chain-weighted real GDP in the current quarter ($RECESS1$) and the following four quarters ($RECESS2$ to $RECESS5$) from the Survey of Professional Forecasters. It was downloaded from https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/survey-of-professional-forecasters on April 22nd, 2024.

The file **SPF.xlsx** is a version of the previous file with the 4 missing observations on RECESS5 (indicated in red) set to the observations on RECESS4, following Croushoure and Marsten (2016).

2 Code

This archive contains 18 Matlab .m files. For the files listed in subsections 2.2 to 2.4 below, run those named xxxxxEst.m first to generate the files required by those named xxxxxEval.m or xxxxxFT.m.

2.1 Data and Code

Data.m reads in routputMvQd.xlsx, FRED.xlsx, NFCI_vintages.xlsx and SPF.xlsx. It uses the data in these files to create the first final, advance data and final vintage measures of the $R1$ indicator, as well as the first final and advance data versions of the NFCI. It also creates the yield spread and yield inversion dummy. It then writes the data to three .mat files, YSRep.mat (used for the narrow replication), YSRep1973.mat (broad replication), YSRep1971.mat (additional results in the online appendix).

SummaryStats.m computes the summary statistics and performs the Shapiro-Wilk tests reported in Table A8 of the appendix. It calls the file **swtest.m** which is available from the Matlab file exchange at https://www.mathworks.com/matlabcentral/fileexchange/13964-shapiro-wilk-and-shapiro-francia-normality-tests.

2.2 Narrow Replication

NarrowEst.m estimates the probit models and produces forecasts for the narrow replication. Set $rel = 1$ to estimate and produce forecasts using the first final data and $rel = 2$ to do the same using the advance data. Forecasts are written to NarrowFF.mat or NarrowAD.mat.

NarrowEval.m produces forecast evaluation metrics for the narrow replication using the forecasts in NarrowFF.mat, NarrowAD.mat, plus the SPF forecasts and $R1$ outturns constructed using the measures in YSRep.mat. Set $rel = 1$ for the first final data (Tables 1 and A3), $rel = 2$ for the advance data (Table A1) and $rel = 3$ to evaluate forecasts based on the first final data against outturns from the final vintage data (Tabe A2). Forecast errors and log-scores for the first final data are written to NarrowFS.mat.

NarrowFT.m performs the Fluctuation Test for the forecasts produced with, and evaluated against, the first final data. It uses the forecasts in NarrowFF.mat, plus the SPF forecasts and $R1$ outturns constructed using the measure in YSRep.mat. The FT-statistics are written to NarrowFT.mat.

2.3 Broad Replication

BroadEst.m estimates the probit models and produces forecasts for the broad replication. Set $rel = 1$ to estimate and produce forecasts using the first final data and $rel = 2$ to do the same using the advance data. Forecasts are written to BroadFF.mat or BroadAD.mat.

BroadEval.m produces forecast evaluation metrics for the narrow replication using the forecasts in BroadFF.mat, BroadAD.mat, plus the SPF forecasts and $R1$ outturns constructed using the measures in YSRep1973.mat. Set $rel = 1$ for the first final data (Table 2), $rel = 2$ for the advance data (Table A4) and $rel = 3$ to evaluate forecasts based on the first final data against outturns from the final vintage data (Tabe A5). Forecast errors and log-scores for the first final data are written to BroadFS.mat.

BroadFT.m performs the Fluctuation Test for the forecasts produced with, and evaluated against, the first final data. It uses the real-time NFCI probit forecasts in BroadFF.mat, plus the SPF forecasts and $R1$ outturns constructed using the measure in YSRep1973.mat. The FT-statistics are written to BroadFT.mat.

2.4 Other Results

These results all use the first final data only.

FinalNFCIEst.m estimates the probit models and produces forecasts using the final vintage measure of the NFCI. Forecasts are written to FinalNFCI.mat.

FinalNFCIEval.m produces forecast evaluation metrics using the forecasts in FinalNFCI.mat, plus the SPF forecasts and $R1$ outturns constructed using the measures in YSRep1971.mat. These metrics are reported in Table A6.

InversionEst.m estimates the probit models and produces forecasts using the yield curve inversion dummy. Forecasts are written to Inversion.mat.

InversionEval.m produces forecast evaluation metrics using the forecasts in Inversion.mat, plus the SPF forecasts and $R1$ outturns constructed using the measures in YSRep.mat. These metrics are reported in Table A7.

PseudoEst.m estimates the probit models and produces forecasts using pseudo data for the yield spread and real-time NFCI. Forecasts are written to Pseudo.mat.

PseudoEval.m produces forecast evaluation metrics using the forecasts in Pseudo.mat, plus the SPF forecasts and $R1$ outturns constructed using the measures in YSRep1973.mat. These metrics are reported in Table A9.

LogitEst.m estimates the logit models and produces forecasts using the yield spread and real-time NFCI. Forecasts are written to Logit.mat.

LogitEval.m produces forecast evaluation metrics using the forecasts in Logit.mat, plus the SPF forecasts and $R1$ outturns constructed using the measures in YSRep1973.mat. These metrics are reported in Table A10.

2.5 Figures

Figures.m produces the figures in the paper and appendix.

- Set $figflag = 1$ for a plot of the yield spread, final vintage NFCI and $R1$ recession indicator (first final data). This is Figure 1.
- Set $figflag = 2.1$ for a plot of the yield spread, final vintage NFCI and $R1$ recession indicator (advance data). This is Figure A1.
- Set $figflag = 2.2$ for rolling forecast metrics and fluctuation tests, yield spread versus SPF. This is Figure A2.
- Set $figflag = 2.3$ for rolling forecast metrics and fluctuation tests, real-time NFCI versus SPF. This is Figure A3.
- Set $figflag = 2.4$ for density plots. This is Figure A4.

Reference

Dean Croushore and Katherine Marsten (2016) "Reassessing the Relative Power of the Yield Spread in Forecasting Recessions" *Journal of Applied Econometrics* 31(6) pp1183-1191.