

FINANCIAL ECONOMETRICS
SHANGHAI JIAO TONG UNIVERSITY
SUMMER SCHOOL 2026
EMPIRICAL EXERCISE 16.1

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Reference: Stock, J.H. and Watson, M.W., Introduction to Econometrics (4th Edition, Global Edition)

Data: `us_macro_quarterly.csv`. Inflation is built from the PCE price index $PCEP = PCEPTI$ as $Infl_t = 400 [\ln(PCEP_t) - \ln(PCEP_{t-1})]$. Sample period 1963:Q1–2012:Q4.

Empirical Exercise 16.1. This exercise is an extension of Empirical Exercise 14.1. Using the data file `us_macro_quarterly.csv`, compute inflation from the price index for personal consumption expenditures as

$$Infl_t = 400 [\ln(PCEP_t) - \ln(PCEP_{t-1})],$$

where $PCEP = PCEPTI$. For all regressions use the sample period 1963:Q1–2012:Q4 (data before 1963 may be used as initial values for the lags in the regressions).

(a) Using the data on inflation through 2012:Q4 and an estimated AR(2) model:

- (i) Forecast $\Delta Infl_{2013:Q1}$, the change in inflation from 2012:Q4 to 2013:Q1.
- (ii) Forecast $\Delta Infl_{2013:Q2}$, the change in inflation from 2013:Q1 to 2013:Q2. (Use an iterated forecast.)
- (iii) Forecast $Infl_{2013:Q2} - Infl_{2012:Q4}$, the change in inflation from 2012:Q4 to 2013:Q2.
- (iv) Forecast $Infl_{2013:Q2}$, the level of inflation in 2013:Q2.

(b) Repeat (a) using the direct forecasting method.

(c) In Empirical Exercise 14.1 you carried out an ADF test for a unit root in the autoregression for `Infl`. Now carry out the unit-root test using the DF-GLS test.

Are the conclusions based on the DF-GLS test the same as those you reached using the ADF test? Explain.

Calculations performed in Python/Stata using `us_macro_quarterly.csv` over 1963:Q1–2012:Q4.