

# Financial Econometrics I

## Problem Set 4: ARIMA Models: Nonstationarity and Forecasting

December 3, 2018

**Learning objectives:** After solving the following questions you should be able to

- (a) Understand the main reasons for the nonstationarity of time series data.
- (b) Know how to restore stationarity using appropriate differencing methods.
- (c) Know how to formally test the existence of stochastic/deterministic trend.
- (d) Know how to fit ARIMA models, interpret estimation results, conduct basic hypothesis tests, and forecast future values based on fitted models.

1. **FY Exercise 2.9**
2. **FY Exercise 2.10**
3. **FY Exercise 2.11**
4. **FY Exercise 2.12 (Simulation Exercise)**
5. **FY Exercise 2.13 (Empirical Exercise 1)**
6. **Empirical Exercise 2**

In Lecture 4, we learned how to do forecasting based on a general ARIMA model via analyzing the SPDR gold price data. Recall that in Problem Set 3, you were asked to fit an ARIMA model to the daily price data of the Apple stock in 2013. Now use the same Apple data to reproduce the forecasting for SPDR gold prices, i.e., you will need to specify an appropriate ARIMA model for the Apple stock price data, estimate the selected model, predict stock prices in December, and compare your predicted values with those realized values. Comment on your findings.