

Math 574, Marcel Blais, Fall 2020

## ARIMA Project

You are *required* to work with your project partner on this problem.

1. Choose two time series for this project:

- A time series of daily returns for one of the stocks used in your portfolio management project &
- Two financial or economics time series, other than asset returns. *Do not* use data for assets that trade on stock exchanges (stocks, ETFs, ETNs, etc.).

Model these time series using an  $ARIMA(p, d, q)$  process. For each time series remove the most recent four data points from the time series so that these may be treated as future data points.

Using either MATLAB<sup>1</sup> or Python, fit your data to several different ARIMA models (make sure to exclude the last four points in your fit). At a minimum you should include all cases for  $p$  and  $q$  in the set  $\{0, 1, 2\}$ .

Choose the best fitting model, justifying your choice, and use this model to forecast the next four data points in each of the time series. Compare your forecast to the actual future data points. What conclusions can you make? Make sure to examine the residuals to check the appropriateness of your model.

Your project report should be professionally written and easy to read and understand. Treat this submission as if you were giving it to a superior at work. Make sure to include graphs and plots to support your models. Submit relevant results, plots, MATLAB/Python code, results, and conclusions. Submit an electronic version of your code and report in *ARIMA574.zip* on the course Canvas site.

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<sup>1</sup>The ARIMA function in the MATLAB Econometrics toolbox may be useful here.