

Individual Project

ECMT3130 – Semester 2, 2020

For this project, you will be provided with the time series. To be more precise, you will be given the dataset consisting of multiple price series, and you will be assigned a specific price series from this dataset. In addition, you will be provided with the date for the last observation of the first estimation window. This date will vary among the students; this is done so that each and every one of you will be working with “unique” time series (which will result in distinct results of the analysis).

The goal of this exercise is to generate one-step-ahead and twelve-step-ahead forecasts of nominal commodity price series, and to compare these with the forecasts from a random walk process. Select AR(p) model for log-transformed nominal prices as the model of choice for price forecasting. Use SIC to determine the lag order of the model; in doing so, allow for a maximum of up to 12 lags. (At this point, you can also check for the order of integration using the Augmented Dickey–Fuller test; regardless of the test results, proceed by modeling and forecasting the price series as if they were integrated of order zero, or more broadly, as the covariance-stationary series).

Apply a rolling window forecasting scheme. Let the first estimation window run from Jan 1992 to the month and year of the unique date supplied to you.

Generate one-step-ahead forecasts for all possible months until December 2018. Generate 12-step-ahead forecasts for all possible months until December 2018 using direct and iterated methods. Combine these two sets of 12-step-ahead forecasts using equal weighting scheme.

Both for one-step-ahead and twelve-step ahead forecasts, and, as applicable, for direct, iterated, and combined forecasts, calculate RMSFE, and compare these with the RMSFE from the random walk model. Using the Diebold-Mariano test, formally examine the hypotheses of equal forecast accuracy of the selected AR(p) model with the random walk model.

Prepare a brief report, where you outline the steps used in generating the forecasts, and the forecast accuracy measures. Present the time series of the prices in a Figure. Present the forecast accuracy measures in a table. Conclude whether any one of the models, or combined forecasts, offer an improvement over the random walk model.

Upload the report (as a pdf) and the R file with all the coding for your project by the due date. (Note: the report should only include one figure and one table; the text should not exceed 1500 words).