

Homework 6

Eco 5316 Time Series Econometrics

Spring 2018

Due: Sunday, April 8, 11.55pm

Problem 1

Download the weekly data for Crest and Colgate market shares from 1958 to 1962 stored in <http://myweb.ttu.edu/jduras/files/teaching/e5316/toothpaste.csv>. This file also contains pulse and step functions associated with a decisions by the Council on Dental Therapeutics of the American Dental Association to endorse Crest as an “important aid in any program of dental hygiene”. The goal of this problem is to analyze the effect of this intervention on the market share of Colgate and Crest.

- (a) Plot the market shares of Colgate and Crest for the whole sample. Comment on their size and changes that occurred over time.
- (b) Use `auto.arima` to estimate two ARIMA models for pre-intervention period (one model for market share of Crest, and one model for market share of Colgate). Make sure to check that these models are adequate, modify them if necessary.
- (c) Identify and estimate two transfer function models for the whole sample (again one model for market share of Crest, and one model for market share of Colgate).
- (d) Plot the estimated effects of the intervention based on your models from (c). Comment on the size of the effect for Crest and for Colgate. Note that the effect does not have to be the same, since the combined share of these two companies is smaller than one, there are also other firms in the same market.