Homework on the Bass Model

Marketing 3597: Marketing Analytics

Fall 2017

NOTE: This homework is due on Saturday, November 18, before class, which gives you about two weeks to work on this. Please type the answers and bring a hard copy, no need to print out all the R outputs.

Make sure you can run the .rmd document shared with you as lecture notes in class. In order to do that, you need to do the following:

1. change the working directory to your own local directory, by changing the code in line 116 of **setwd().**
2. Copy/download the images folder into the same folder as the .rmd file, because the .rmd file calls for some pictures stored in that folder.

Select the **iPhone.csv** file as input for your homework.

1. Using all the data in the file, the Rmd file will plot the fitted Bass model. Copy the two plots here, one for the predicted cumulative sales and the other one for predicted sales.
   1. What are the N, p, q values? Do you think they are reasonable? Why or why not?
   2. Based on the plots, does the model over predicted the sales or under predicted the sales?
   3. Based on the plots, approximately when is the predicted peak period? Is that reasonable?
2. Try a few different scenarios by changing the starting or the ending dates and compare the N, p, q values in each scenario
   1. Change starting period to be 2010: Q1
   2. Change the ending period to be 2010: Q1
3. As discussed in class, iPhone is a brand, not a product category, its sales would be influenced by price, promotion and its competitors.
   1. Do you think applying the Bass model on the whole data set is a good idea or not? Why or why not?
   2. How about applying the Bass model on only part of the data? Which part do you think it makes more sense? The beginning part, middle part, or the later part of the data?

1. Another popular model to do sales forecasting, is to apply a regression model

In this model, t refers to time, you can use the number of quarters since the product was launched. That is when iPhone was first launched 2007: Q3 is when t=1, 2007:Q4 is when t=2, 2008: Q1 is when t=3, …

1. Estimate this model using R function lm(), present the result, and comment on whether the model makes sense, based on (1) the statistics from the model results and (2) the model implications to future forecasting.
2. Estimate the model again, without . What are the implications to future sales forecasting?
3. Compare the results from 4-a, and 4-b, and comment on why we do or do not need the .
4. Compare the results from your best Bass model (with the data period of your choice) and the better regression model between 4-a and 4-b, which one do you think is the best for forecasting iPhone. Why?