Strategic Marketing Decision Making 2025-2026

Master in Data Science and Marketing Analytics
Erasmus School of Economics
Dr. Vardan Avagyan

Group Assignment 1
Due on: 18 September 2025, 1:00pm

Instructions

This assignment is based on weekly sales data from an apparel brand (for interpretation, assume the brand is *FourTex*). In addition to weekly sales, the dataset includes weekly spending on different marketing channels such as TikTok, Facebook, and Google Ads.

When completing this assignment, follow the step-by-step approach demonstrated in the lecture and textbook examples in Chapter 3. You may use the same model structures, data transformations, and R functions provided there. This will help you focus on interpretation rather than coding from scratch.

Assume you are part of the Data Science Department at FourTex. Management has approached your team to conduct a marketing mix modelling (MMM) analysis and support strategic decisions. You are expected to model the impact of marketing activities on sales and make actionable recommendations.

Question 1 (2 points)
Estimate a marketing mix model that incorporates carry-over effects and diminishing returns of marketing mix. Present the final model output and interpret all estimated coefficients.

Question 2 (2 points)
Report the ROI of each marketing channel based on the estimation output in Question 1. Which marketing channel yields the highest ROI?

Question 3 (1 point)
Is the model-recommended optimal budget allocation different from the actual allocation? How do you suggest FourTex should reallocate its budget across TikTok, Facebook, and Google to maximize sales? Support your answers with relevant figures.

Question 4 (3 points)
Do different marketing channel pairs have synergistic or antagonistic effects? For each pair of channels (e.g., Facebook–TikTok, Facebook–Google Ads, TikTok–Google Ads), interpret the model results and explain the rationale. Your interpretation should explicitly consider the nature and role of each channel (e.g., TikTok's reach and virality, Facebook's targeting, Ad's awareness-building) rather than giving a generic answer. Support your explanation with relevant model output(s).

Appendix
Include your full R code in the appendix to ensure reproducibility of your results.