

Appendix to

A Primer on Out-of-the-Box AI Marketing Mix Models

TABLE A: Database provided by Spanish Telecommunications firm.

Variables: Business Name	Variables: Technical Name	Description	Descriptive Statistics
Dependent variable			
Sales	Sales	Continuous variable representing the brand revenue per week in monetary units.	Mean: 33,476.04€ Std.Dev: 8,213.88€ Min: 9,918€ Max: 52,353€
Date variable			
Date	Fecha_lunes	Date variable that holds the date of the first day of the week.	Number of weeks: 265 Min: 01/01/2018 Max: 01/23/2023
Context variables			
Industry Trend	cnmc_sem	Continuous variable. Public variable indicating the telecommunications market sales in Spain	Mean: 258,499.54€ Std.Dev: 53,053.42€ Min: 55,803.60€ Max: 377,170.50€
Consideration	Consid_fija	Continuous variable representing customer's propensity to contemplate a specific product or brand.	Mean: 17.18 Std.Dev: 1.95 Min: 14.17 Max: 23.54
Advertising Recall	Rec_publi	Continuous variable representing the ability of advertisements to remain in customer memory.	Mean: 41.67 Std.Dev: 4.38 Min: 31.39 Max: 53.80
State of Alarm during COVID	Covid_Ealarma	Continuous variable. Calculated variable containing the COVID number of deaths during state of alarm	Mean: 181.72 deaths Std.Dev: 1,029.18 deaths Min: 0 deaths Max: 10,823 deaths
Easter without COVID	Santa_SinCovid	Dichotomous variable. Dummy variable representing with a value of 1 the week coinciding with Easter	There are two values: Value 0 (NO): 261 records (98.49%) Value 1 (YES): 4 records (1.5%)
Holiday August 15th	Pte_Agosto	Dichotomous variable. Dummy variable representing with a value of 1 the week coinciding with August 15th	There are two values: Value 0 (NO): 261 records (98.49%) Value 1 (YES): 4 records (1.5%)

Christmas Holidays	Navidad	Dichotomous variable. Dummy variable representing with a value of 1 the week coinciding with Christmas	There are two values: Value 0 (NO): 260 records (98.11%) Value 1 (YES): 5 records (1.88%)
Trend	Tendencia	Discrete variable representing the number of the week. This variable captures the trend overtime.	Record count: 265 weeks. Min: 1 week Max: 265 weeks

Paid media variables

TV	tv_cst	Continuous variable representing the brand weekly spend on TV advertising	Mean: 202,507.62€ Std.Dev: 184,533.01€ Min: 0€ Max: 9,032,24.24€
Display Branding	disp_Br_cst	Continuous variable representing the brand weekly spend on Display Branding advertising	Mean: 7,780.43€ Std.Dev: 16,567.33€ Min: 0€ Max: 98,645.33€
Display Branding Video	disp_Br_V_cst	Continuous variable representing the brands weekly spend on Display Branding Video advertising	Mean: 5,251.93€ Std.Dev: 11,580.71€ Min: 0€ Max: 106,115.77€
Performance	perf_cst	Continuous variable representing the brands weekly spend on Performance advertising	Mean: 28,170.33€ Std.Dev: 10,965.21€ Min: 4,157.25€ Max: 77,315.76€
Cinema	cine_cst	Continuous variable representing the brand weekly spend on Cinema advertising	Mean: 815.30€ Std.Dev: 3,847.25€ Min: 0€ Max: 25,055€
Radio	radio_cst	Continuous variable representing the brands weekly spend on Radio advertising	Mean: 7,110.92€ Std.Dev: 23,063.07€ Min: 0€ Max: 118,966.05€
Brand Content	Bc_cst	Continuous variable representing the brands weekly spend on Brand Content advertising	Mean: 14,111.27€ Std.Dev: 13,693.81€ Min: 0€ Max: 61,208.54€
RRSS	rrss_t_cst	Continuous variable representing the brands weekly spend on RRSS advertising	Mean: 16,868.33€ Std.Dev: 7,932.31€ Min: 0€ Max: 50,686.66€
Out-of-home	ext_cst	Continuous variable representing the brands weekly spend on Out of Home advertising	Mean: 25,753.22€ Std.Dev: 74,967.96€ Min: 0€ Max: 366,250.07€
SEM Brand	sem_Brand_cst	Continuous variable representing the brands weekly spend on SEM Brand advertising	Mean: 36,039.83€ Std.Dev: 8,439.85€ Min: 17,023.04€ Max: 80,285.97€
Print press and magazines	pr_rev_cst	Continuous variable representing the brands weekly spend on Print press and magazines.	Mean: 246.03€ Std.Dev: 2,817.61€ Min: 0€ Max: 45,000€
YouTube Brand Content	you_Bc_cst	Continuous variable representing the brands weekly spend on YOUTUBE Brand Content advertising	Mean: 6,339.71€ Std.Dev: 5,468.29€

			Min: 0€ Max: 34,952.42€
TV Digital	tv_dig_cst	Continuous variable representing the brand's weekly spend on TV Digital advertising	Mean: 6,310.49€ Std.Dev: 13,611.14€ Min: 0€ Max: 62,648.03€
TV Brand Content	tv_Bc_cst	Continuous variable representing the brands weekly spend on TV Brand Content advertising	Mean: 6,613.63€ Std.Dev: 21,445.26€ Min: 0€ Max: 123,040.62€
YouTube	you_cst	Continuous variable representing the brand weekly spend in Youtube	Mean: 1,998.94€ Std.Dev: 4,084.14€ Min: 0€ Max: 32,614.05€
SEM Generic	sem_gen_cst	Continuous variable representing the brands weekly spend on SEM Generic advertising	Mean: 12,601.54€ Std.Dev: 11,149.82€ Min: 0€ Max: 56,606.42€

TABLE B: Robyn hyperparameters for each paid media and spending variables: Alphas, gammas, and thetas.

Variables: Business Name	Variables: Technical Name	thetas	alphas	gammas
TV	tv_cst	[0, 0.8]	[0.5,3]	[0.3,1]
Display Branding	disp_Br_cst	[0, 0.3]	[0.5,3]	[0.3,1]
Display Branding Video	disp_Br_V_cst	[0, 0.3]	[0.5,3]	[0.3,1]
Performance	perf_cst	[0, 0.3]	[0.5,3]	[0.3,1]
Cinema	cine_cst	[0, 0.8]	[0.5,3]	[0.3,1]
Radio	radio_cst	[0, 0.4]	[0.5,3]	[0.3,1]
Brand Content	Bc_cst	[0, 0.8]	[0.5,3]	[0.3,1]
RRSS	rrss_t_cst	[0, 0.3]	[0.5,3]	[0.3,1]
Out-of-home	ext_cst	[0, 0.4]	[0.5,3]	[0.3,1]
SEM Brand	sem_Brand_cst	[0, 0.4]	[0.5,3]	[0.3,1]
Print press and magazines	pr_rev_cst	[0, 0.4]	[0.5,3]	[0.3,1]
YouTube Brand Content	you_Bc_cst	[0, 0.5]	[0.5,3]	[0.3,1]
TV Digital	tv_dig_cst	[0, 0.8]	[0.5,3]	[0.3,1]
TV Brand Content	tv_Bc_cst	[0, 0.8]	[0.5,3]	[0.3,1]
YouTube	you_cst	[0, 0.5]	[0.5,3]	[0.3,1]
SEM Generic	sem_gen_cst	[0, 0.4]	[0.5,3]	[0.3,1]