C&T Case Study

Portfolio Allocation - Business Case

Ghaith SASSI

The Problem

Objective : Allocate advertising and promotion budget in-order to miximize the sells

Dataset

Financial Data

A&P = A+P

| Products	Year	Net Sales	Advertising Spend (A)	Promotion Spend (P)
Brand 3	2017.01	€ 3,324,572	€ 141,943	€ 70,620
Brand 1	2017.01	€ 8,692,541	€ 118,484	€ 122,556
Brand 2	2017.01	€ 7,409,735	€ 158,771	€ 134,664
Brand 3	2017.02	€ 4,018,024	€ 191,410	€ 105,656
Brand 1	2017.02	€ 8,248,312	€ 347,991	€ 160,665
Brand 2	2017.02	€ 6,450,413	€ 1,719	€ 163,588
Brand 3	2017.03	€ 6,195,464	€ 191,640	€ 71,928
Brand 1	2017.03	€ 9,853,953	€ 177,934	€ 189,566
Brand 2	2017.03	€ 8,252,658	€ 692,746	€ 72,124
Brand 3	2017.04	€ 7,037,240	€ 529,394	€ 59,240
Brand 1	2017.04	€ 8,514,623	€ 289,726	€ 160,454
Brand 2	2017.04	€ 7,496,722	€ 156,827	€ 85,208
Brand 3	2017.05	€ 5,191,971	€ 43,973	€ 205,990
Brand 1	2017.05	€ 10,116,737	€ 505,794	€ 170,534
Brand 2	2017.05	€ 7,624,827	€ 39,820	€ 169,820
Brand 3	2017.06	€ 8,089,022	€ 848,445	€ 211,139
Brand 1	2017.06	€ 9,220,545	€ 233,246	€ 231,202
Brand 2	2017.06	€ 6,456,173	€ 160,262	€ 151,751
Brand 3	2017.07	€ 5,696,744	€ 171,424	€ 127,890
Brand 1	2017.07	€ 7,809,208	€ 37,082	€ 135,590
Brand 2	2017.07	€ 8,898,625	€ 613,589	€ 110,027
Brand 3	2017.08	€ 7,473,700	€ 125,228	€ 54,610
Brand 1	2017.08	€ 11,123,532	€ 310,344	€ 122,548
Brand 2	2017.08	€ 8,396,893	€ 254,932	€ 97,919

Marketing data

| BRAND	DATE	RATE OF INNOVATION	PRICE PER VOLUME	TDP	SHARE OF VOICE	NET SALES OF COMPETITOR #1	NET SALES OF COMPETITOR #2	PRICE PER VOLUME COMPETITOR #1	MARKET SIZE - SUB MARKET 1
BRAND 1	Mar-2018	1.408282476	€ 8.32	110.0115419	45.192	€ 4,032,382	€ 269,147,223	€ 15	€ 4,390,130
BRAND 1	Apr-2018	1.396744219	€ 8.91	109.830905	63.484	€ 5,264,635	€ 326,998,896	€ 15	€ 5,774,614
BRAND 1	May-2018	1.731031718	€ 9.25	109.8547794	55.952	€ 4,339,679	€ 258,334,093	€ 16	€ 4,933,605
BRAND 1	Jun-2018	1.735802287	€ 9.06	109.9043085	32.28	€ 4,651,524	€ 254,630,304	€ 16	€ 4,559,039
BRAND 1	Jul-2018	1.509909151	€ 9.18	109.8896009	37.66	€ 5,723,941	€ 315,249,204	€ 15	€ 5,336,451
BRAND 1	Aug-2018	1.46833365	€ 9.18	109.9251661	50.572	€ 4,624,968	€ 258,636,353	€ 15	€ 4,088,218
BRAND 1	Sep-2018	1.687874797	€ 9.16	110.0144234	55.952	€ 5,161,005	€ 338,500,890	€ 15	€ 5,549,806
BRAND 1	Oct-2018	1.592928664	€ 8.95	110.0350496	43.04	€ 4,264,099	€ 293,862,340	€ 14	€ 4,300,455
BRAND 1	Nov-2018	1.404413303	€ 9.03	110.0680284	51.648	€ 4,048,102	€ 305,516,550	€ 14	€ 4,187,101
BRAND 1	Dec-2018	1.254668124	€ 9.19	110.0392376	64.56	€ 6,601,889	€ 367,005,850	€ 15	€ 4,900,989
BRAND 1	Jan-2019	1.61485006	€ 8.82	109.9568093	29.052	€ 4,474,340	€ 280,184,982	€ 15	€ 4,132,439
BRAND 1	Feb-2019	1.454100804	€ 9.08	109.8089964	50.572	€ 4,252,534	€ 286,531,961	€ 15	€ 4,230,109
BRAND 1	Mar-2019	1.567676327	€ 9.01	109.9888764	69.94	€ 5,390,723	€ 352,616,435	€ 15	€ 5,510,941
BRAND 1	Apr-2019	1.485176971	€ 9.11	109.9975131	32.28	€ 4,472,898	€ 271,865,446	€ 15	€ 4,294,235
BRAND 1	May-2019	1.808853511	€ 8.99	110.1222835	41.964	€ 4,747,135	€ 284,076,550	€ 15	€ 4,753,118
BRAND 1	Jun-2019	1.489030749	€ 9.24	110.1225787	41.964	€ 6,382,865	€ 343,014,517	€ 15	€ 5,494,650
BRAND 1	Jul-2019	1.498547013	€ 9.27	110.1301916	50.572	€ 4,988,701	€ 268,759,199	€ 15	€ 4,017,583
BRAND 1	Aug-2019	1.456649351	€ 9.25	110.1536272	34.432	€ 5,057,037	€ 275,990,158	€ 15	€ 3,983,493
BRAND 1	Sep-2019	1.621679478	€ 9.16	110.2011924	47.344	€ 5,616,460	€ 355,823,865	€ 15	€ 5,326,453
BRAND 1	Oct-2019	1.58872031	€ 9.04	110.179803	41.964	€ 4,339,254	€ 302,463,468	€ 15	€ 3,984,972
BRAND 1	Nov-2019	1.405355888	€ 9.21	110.156999	44.116	€ 4,531,985	€ 316,749,815	€ 15	€ 4,050,275
BRAND 1	Dec-2019	1.330823828	€ 9.24	110.1427317	60.256	€ 7,303,836	€ 370,681,061	€ 16	€ 4,662,833
BRAND 1	Jan-2020	1.688837106	€ 8.86	110.1553163	22.596	€ 5,168,073	€ 289,099,905	€ 15	€ 4,023,739
BRAND 1	Feb-2020	1.621987831	€ 9.02	110.1800134	58.104	€ 4,760,059	€ 291,851,609	€ 15	€ 4,219,246
BRAND 1	Mar-2020	1.802704136	€ 8.99	109.6761974	61.332	€ 6,254,651	€ 427,549,328	€ 15	€ 5,911,071
BRAND 1	Apr-2020	1.797204193	€ 8.89	109.8716867	55.952	€ 5,140,774	€ 341,538,803	€ 15	€ 4,488,669
BRAND 1	May-2020	1.776701727	€ 8.88	110.1230062	50.572	€ 6,494,290	€ 399,824,008	€ 15	€ 5,633,505
BRAND 1	Jun-2020	1.486628434	€ 8.98	110.019219	51.648	€ 5,104,949	€ 294,495,644	€ 15	€ 4,184,780
BRAND 1	Jul-2020	1.565380994	€ 8.99	110.1254969	43.04	€ 5,155,827	€ 284,206,018	€ 15	€ 3,930,409
BRAND 1	Aug-2020	1.558898235	€ 8.94	110.1607779	78.548	€ 7,016,904	€ 356,992,099	€ 15	€ 4,939,757
BRAND 1	Sep-2020	1.622789588	€ 8.98	110.1724844	53.8	€ 4,719,273	€ 293,321,361	€ 15	€ 4,006,049
BRAND 1	Oct-2020	1.590910703	€ 8.94	110.2269138	75.32	€ 5,074,395	€ 321,298,258	€ 15	€ 4,011,377
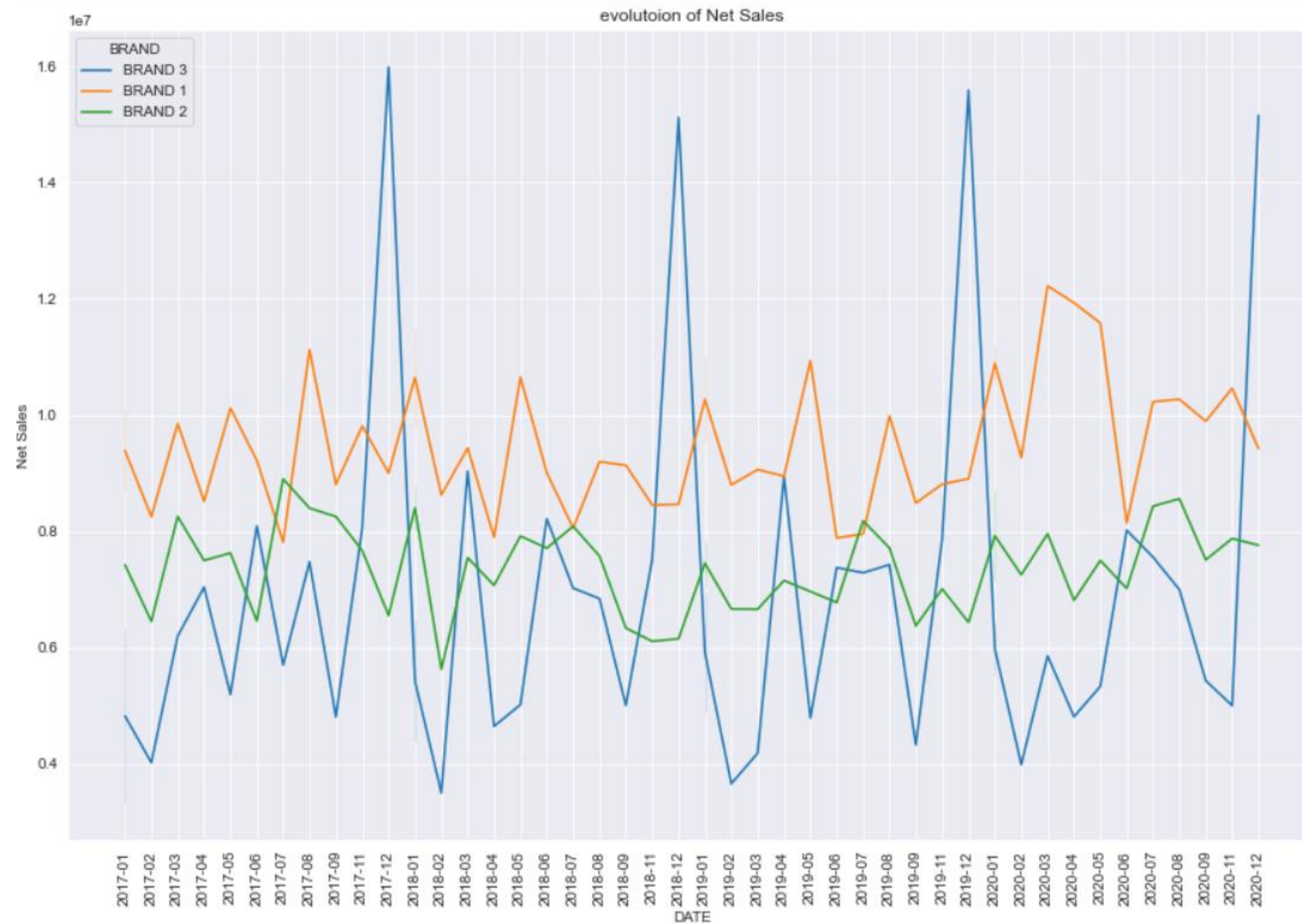
Sales Evolution

Sales Distribution
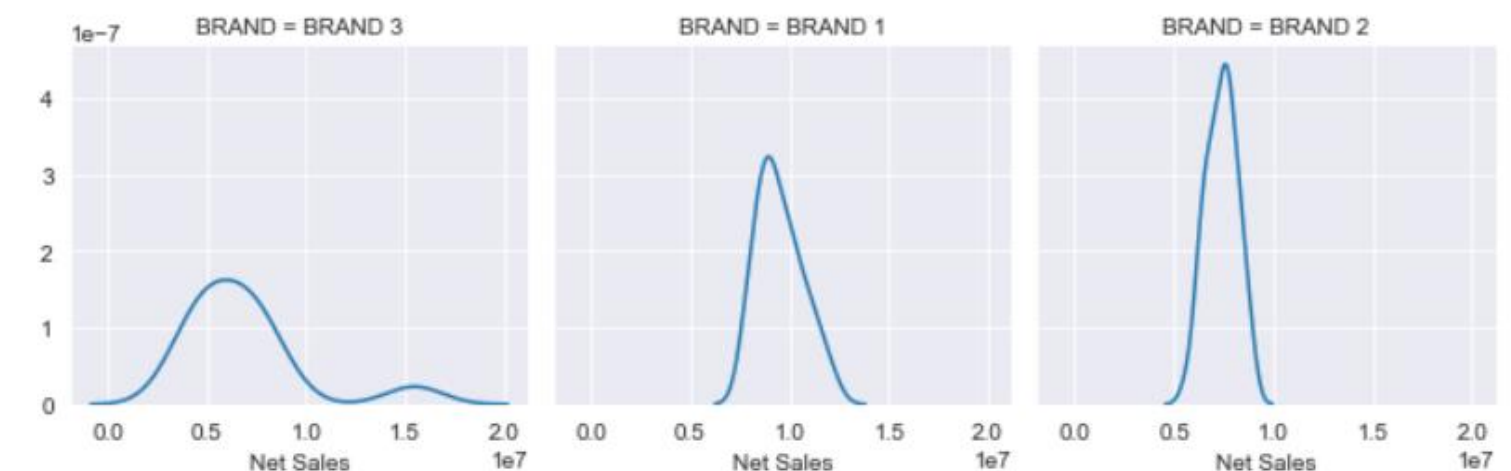
Sales &
Promotion
Spend
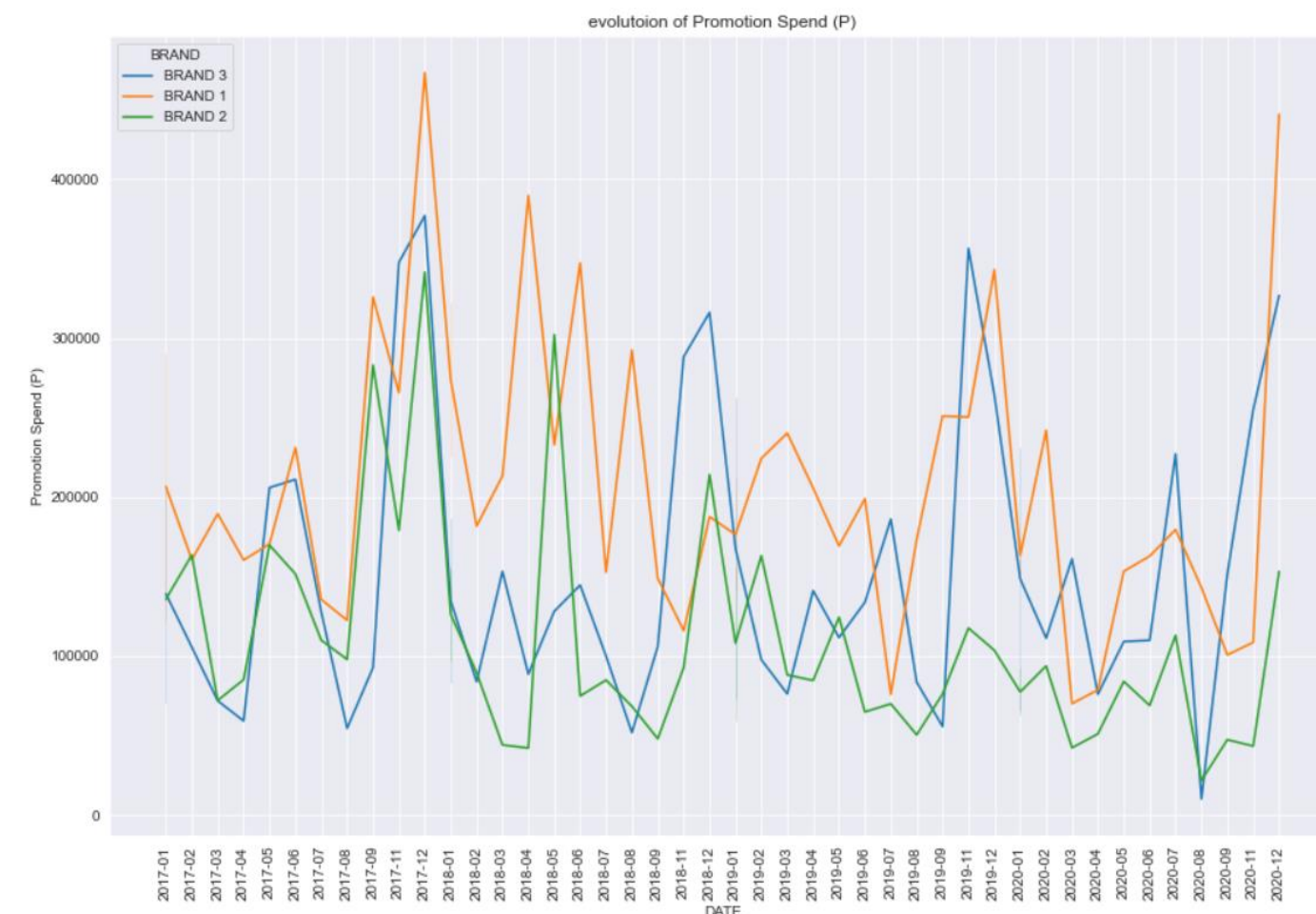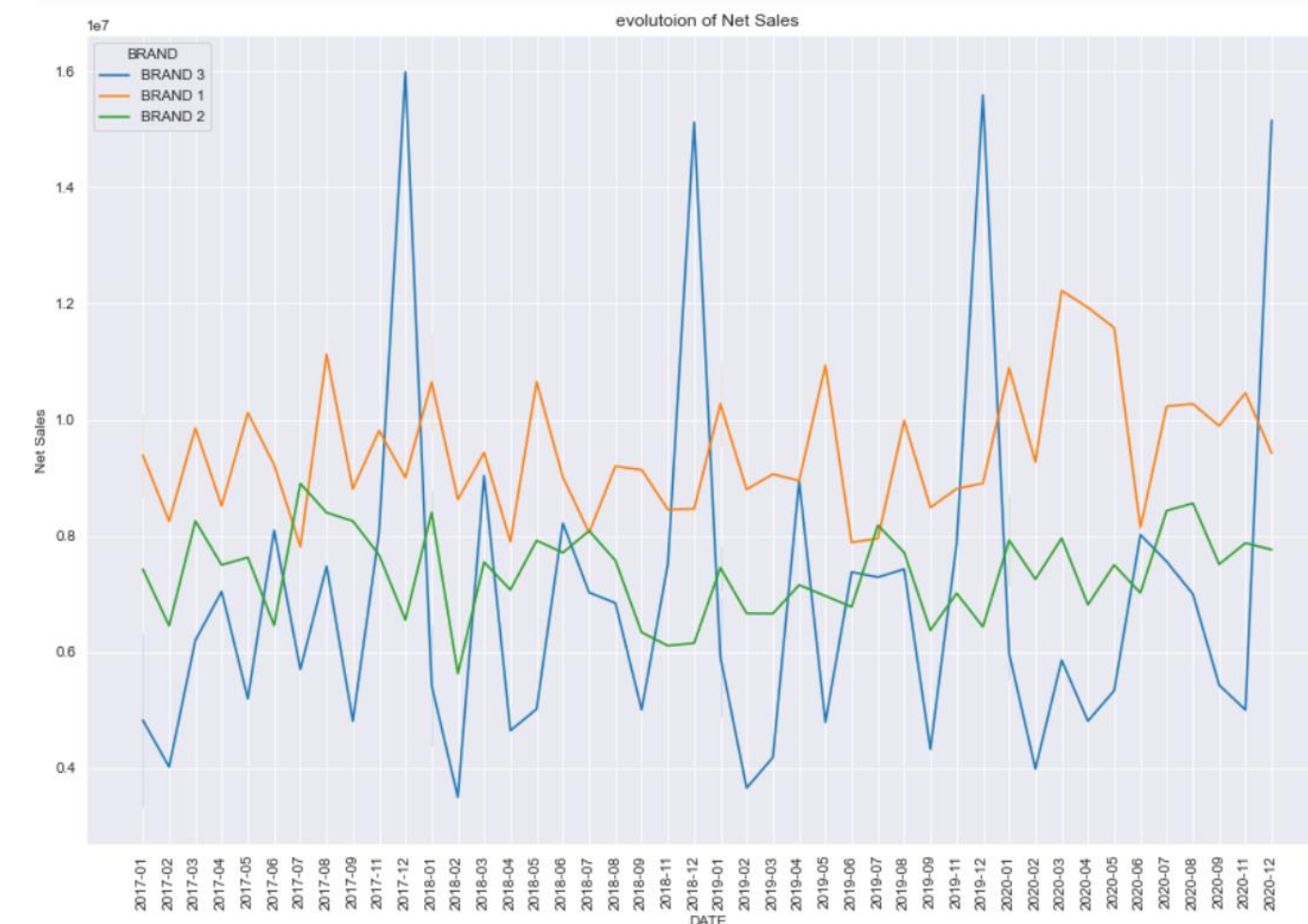
Sales & AdvertisingSpend

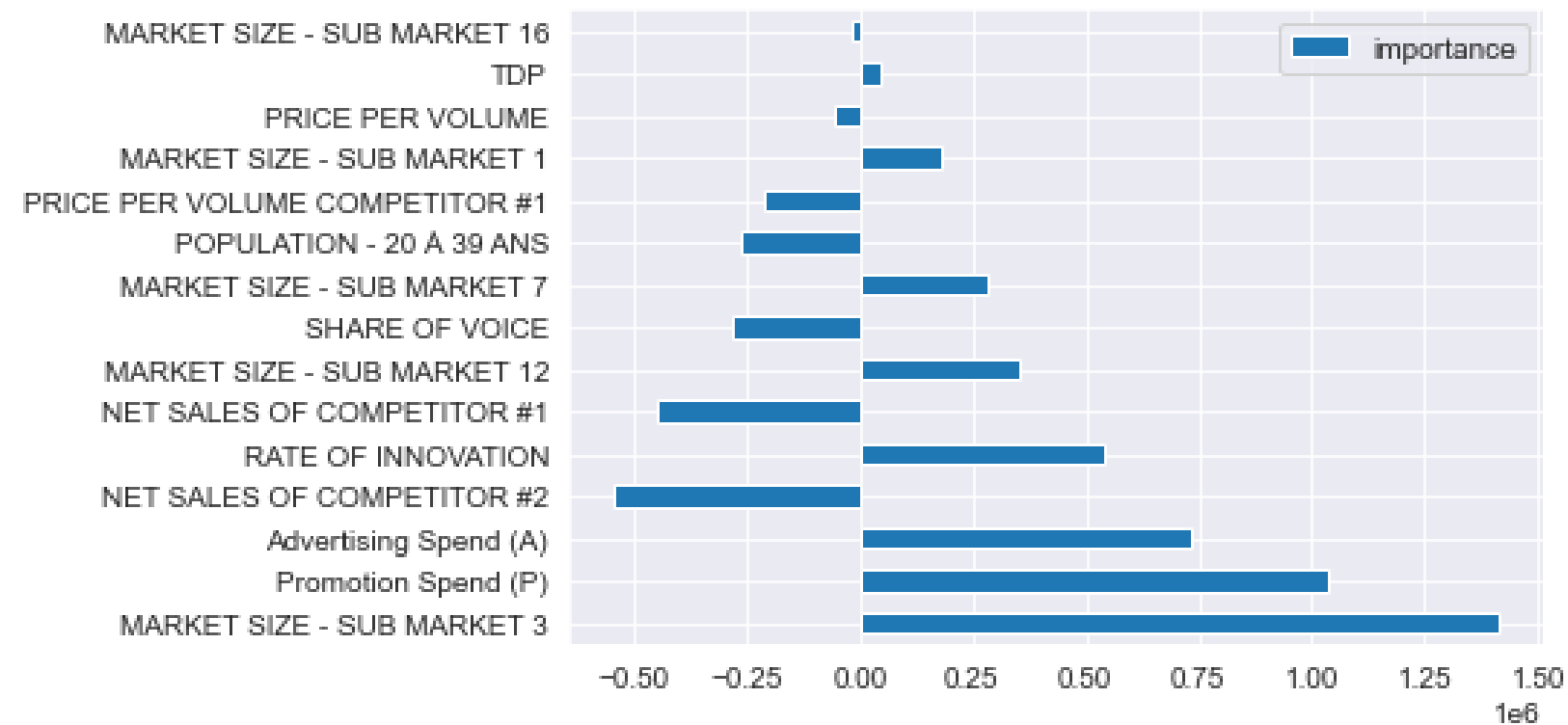# Sales & RATE OF INNOVATION
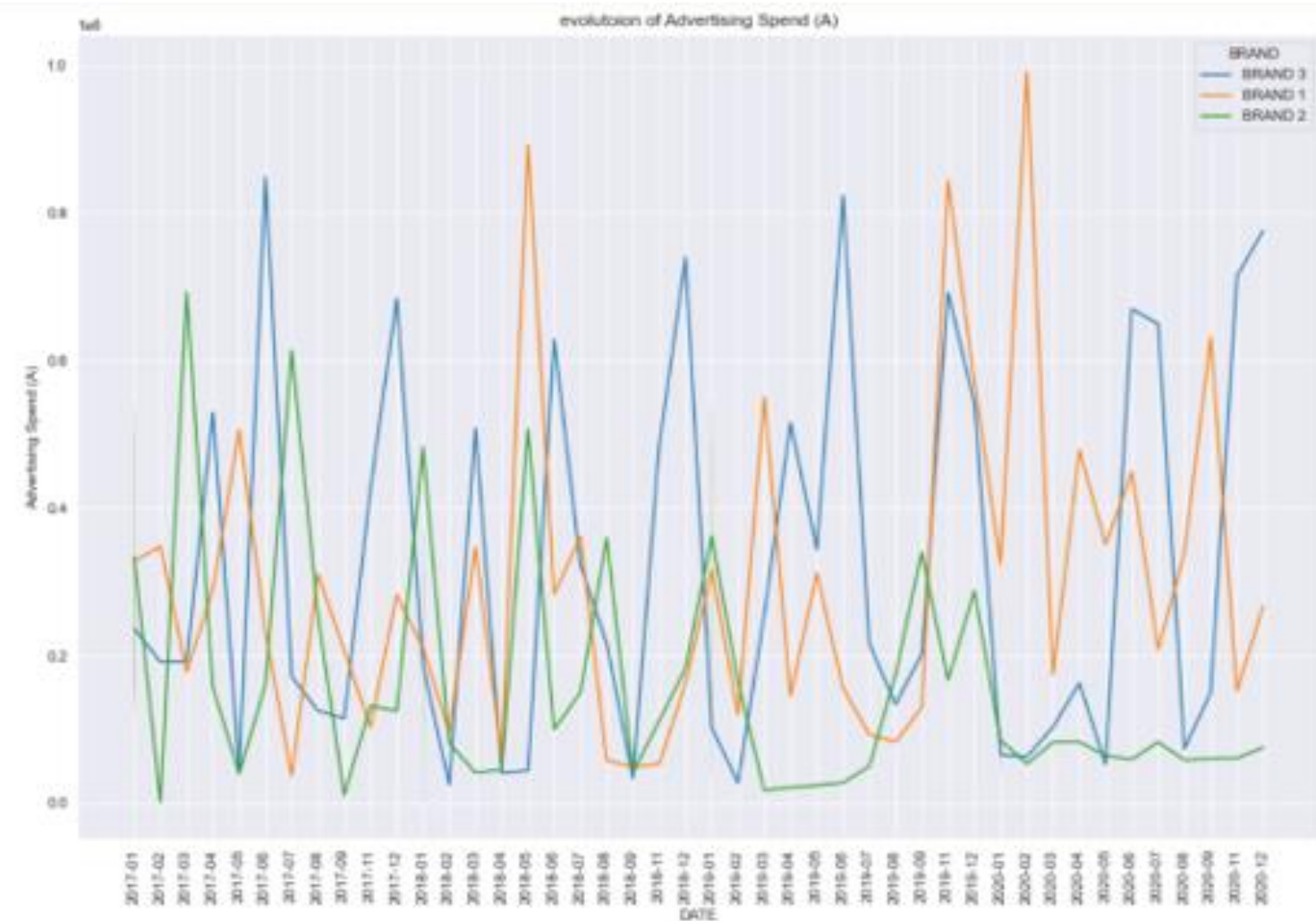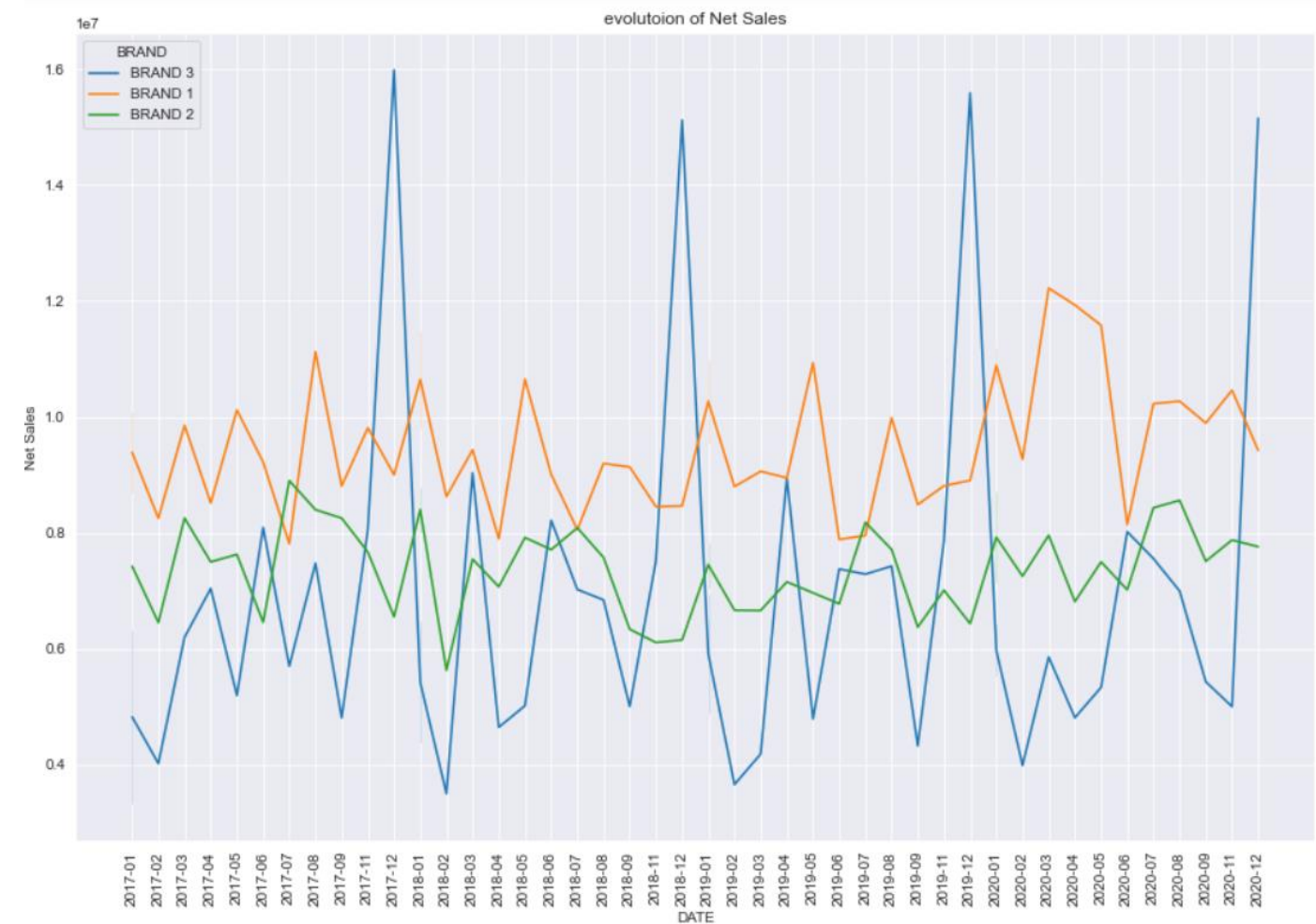
evolutoion of RATE OF INNOVATION
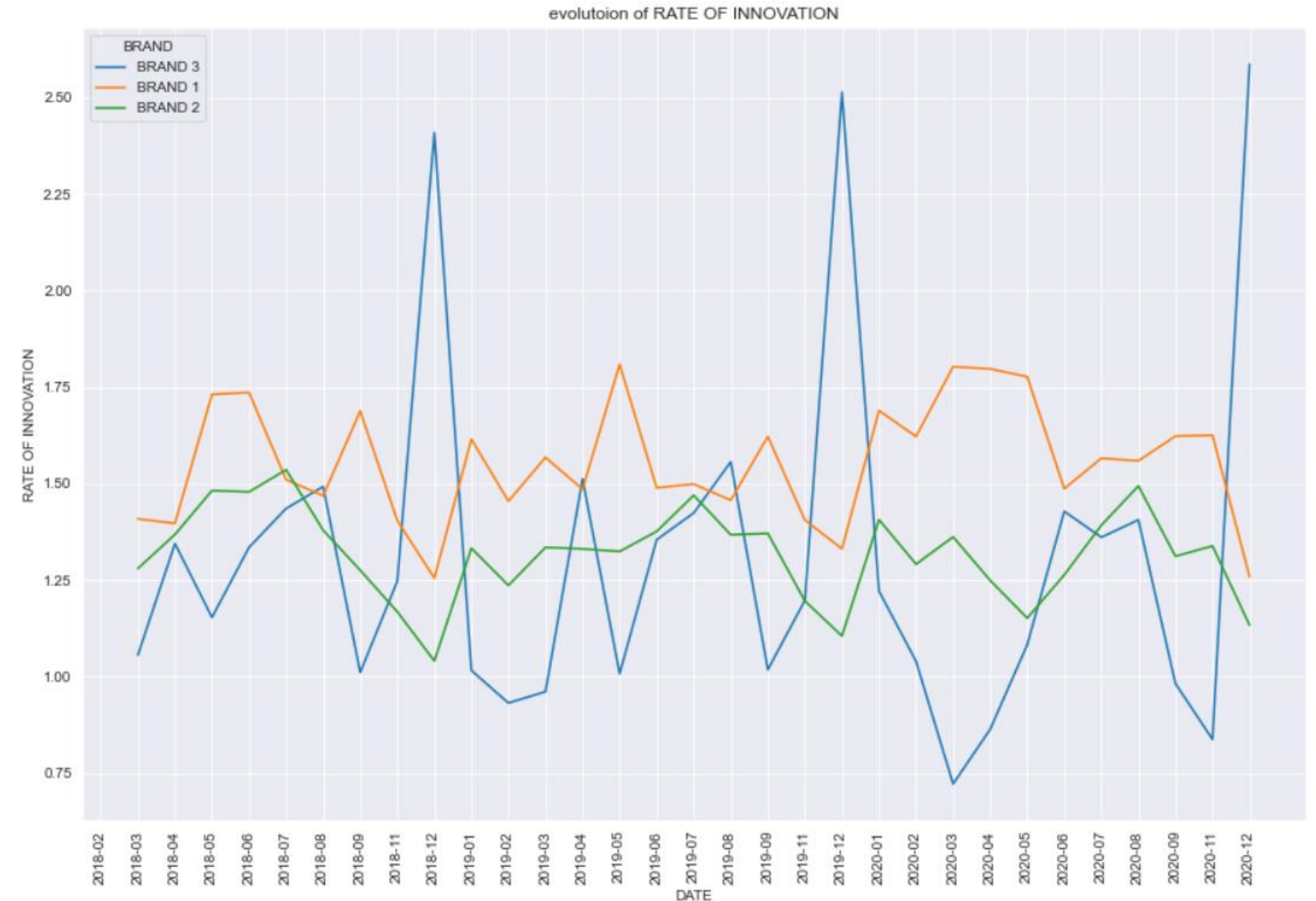
For Brand3 :
❑ Sales and Rate of innovation are corrolated

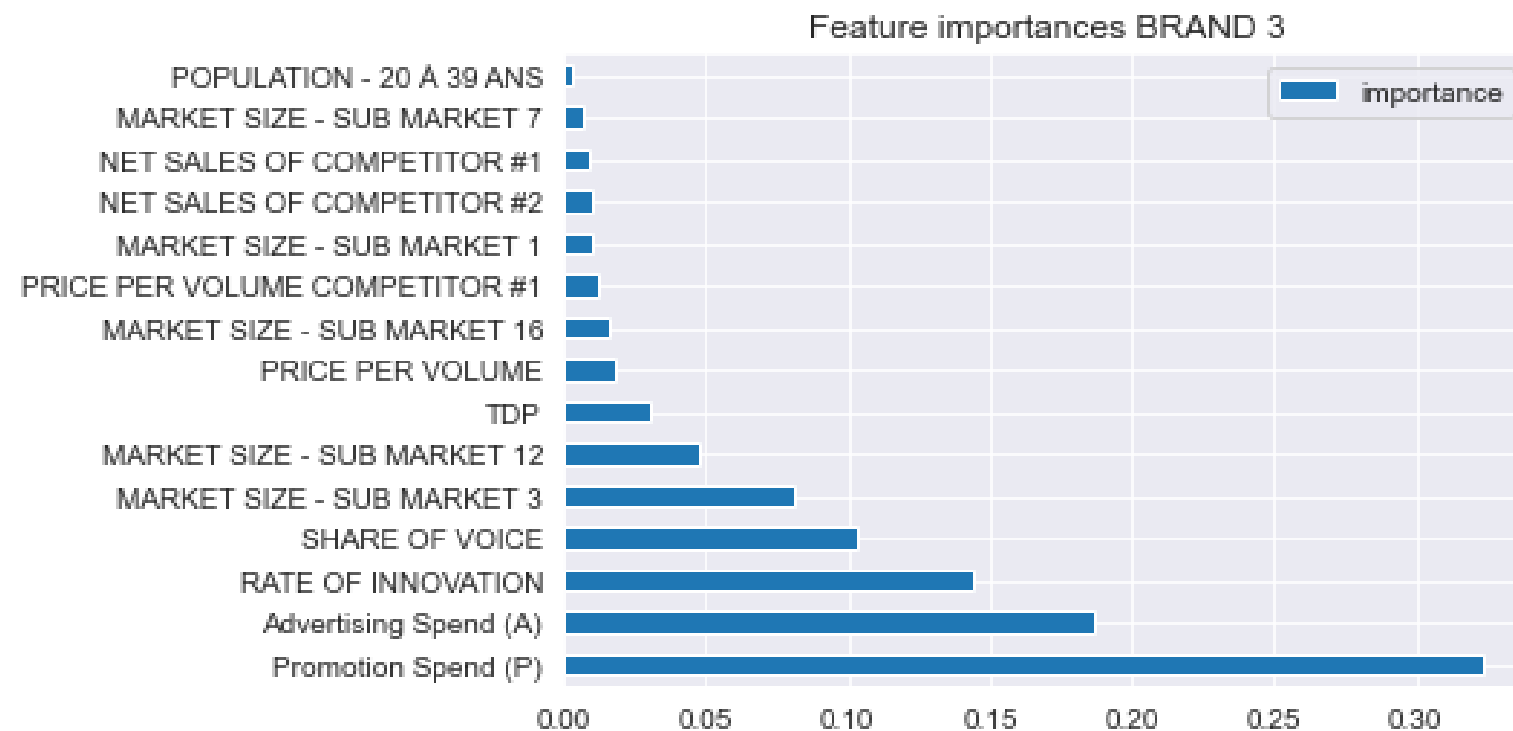❑ Peak in November and December

Correlation Matrix

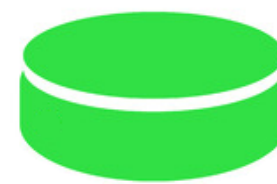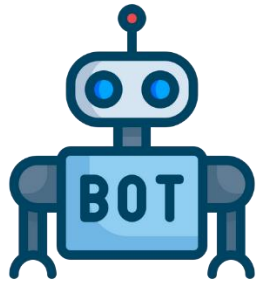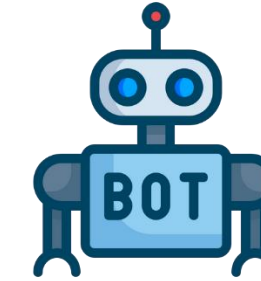- Some highly correlated data: need to be removed
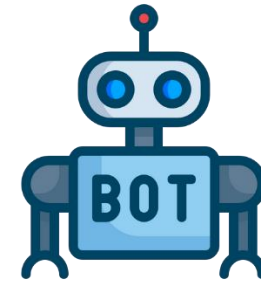
Feature Selection

Lasso

Random Forest

Validation dataset

Model for each brand

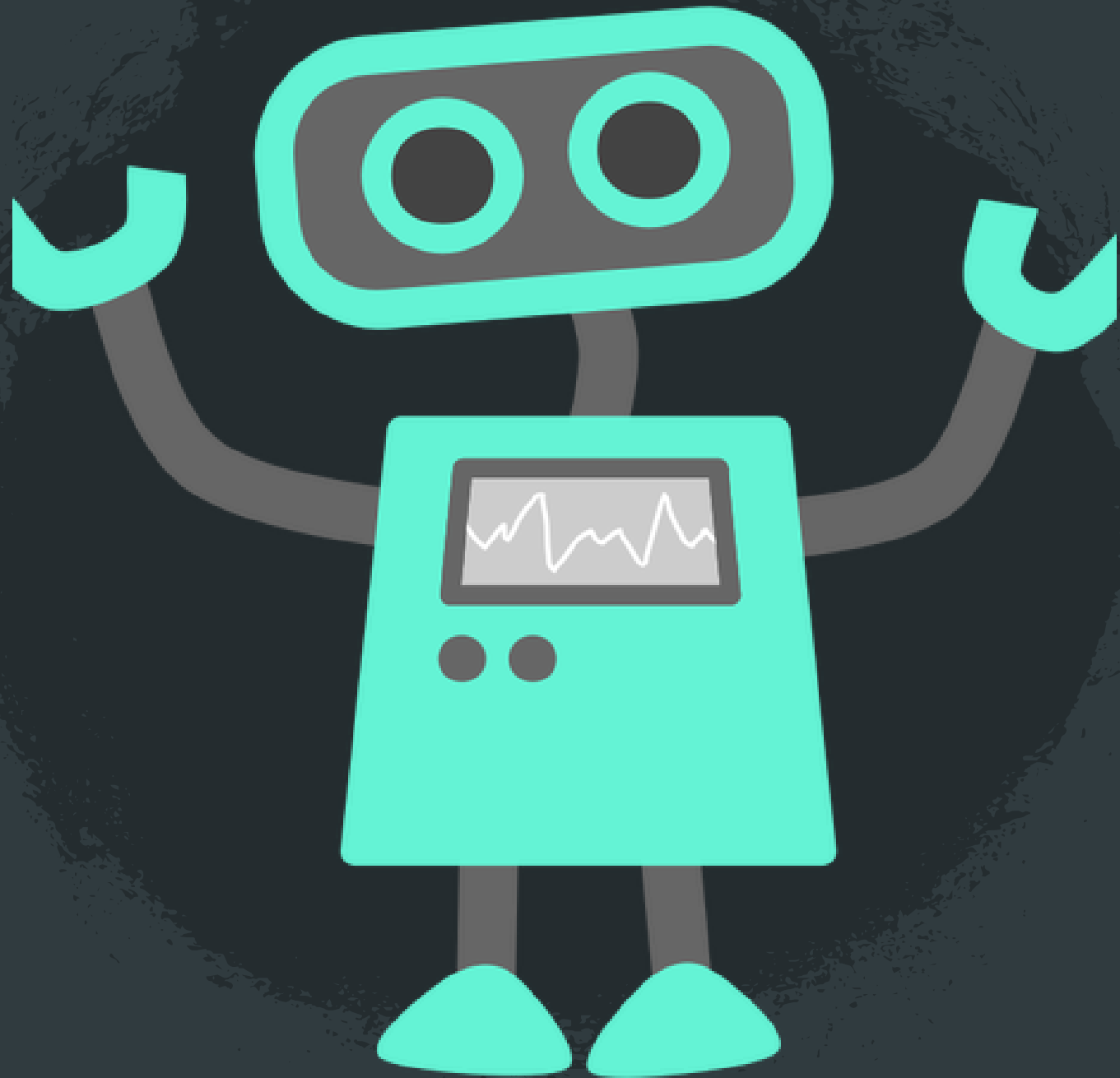Training dataset

Net Sales → A&P

Net Sales → A&P

Net Sales → A&P

Model for Net Sales

2 Approaches

- Linear regression per brand

- Xgboost regressor per brand

Results

Brand 1

	MAPE	RMSE
Linear	0.1010	1025374.66
Xgboost	0.1042	1112335.61

Brand 2
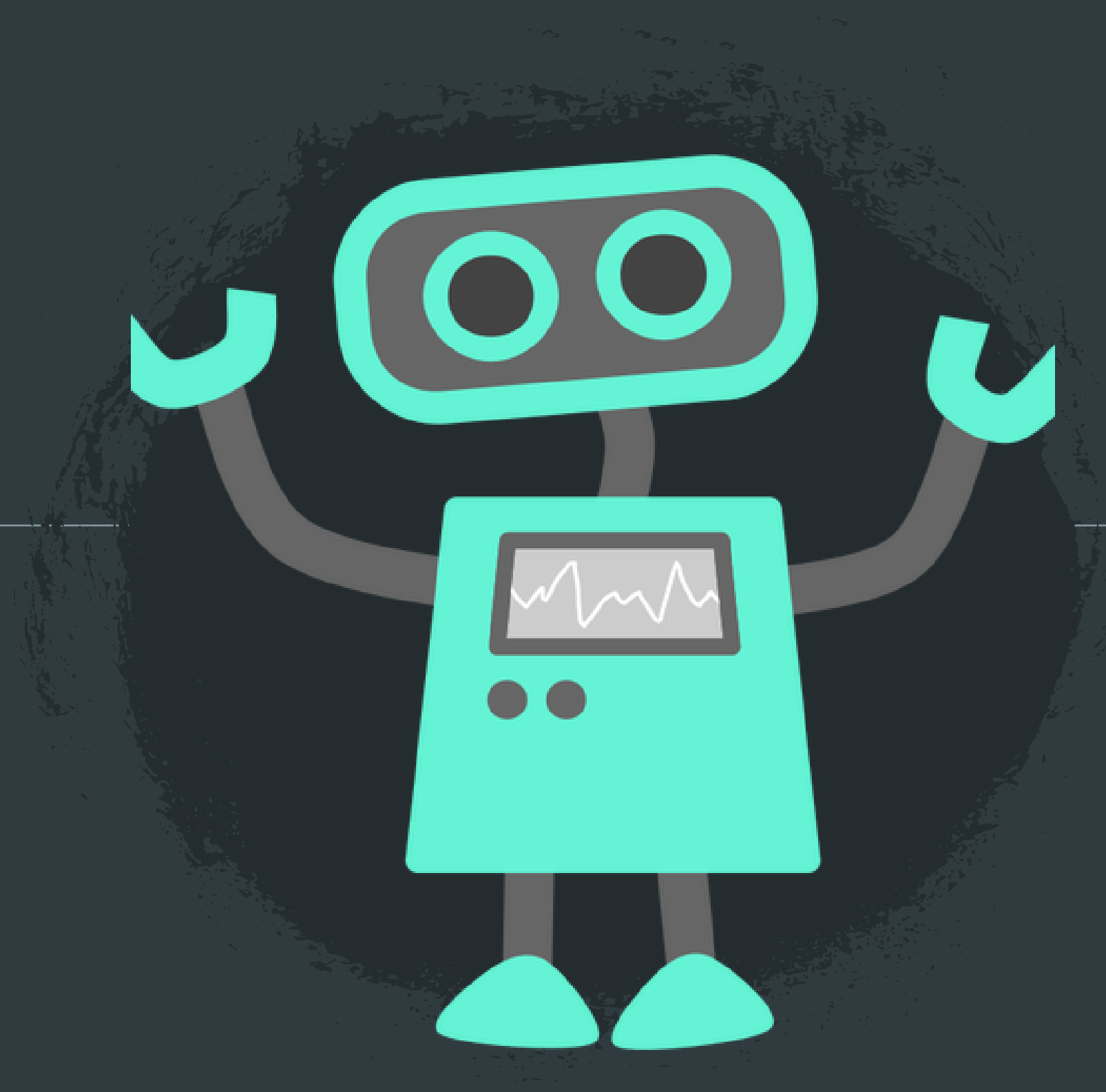
	MAPE	RMSE
Linear	0.0752	770644.12
Xgboost	0.07757	814945.451

Brand 3

	MAPE	RMSE
Linear	0.1288	926250.87
Xgboost	0.17781	1232023.42

Final Model

- Brand 1 and 2: **XGboost**

- Brand 3: **Linear**

Allocating A&P

Method

Search for the best A&P that

maximize

Our Net sales for the next year.

Resutls

	Advertising Spend (A)	Promotion Spend (P)	Net Sales
Brand 1	452868	94418	10293600
Brand 2	580330	26012	8569521
Brand 3	1499777	699993	16702441

Conclusion

- Lack of Advertising and Promotion for brand 2

- Brand 1 is less sensitive in increase in A&P

- We need further data related to nature of the brand to have more efficient approaches.

THANK YOU!