ELECKART MARKET MIX MODELLING

SUBMITTED BY-
DS TITANS
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BUSINESS UNDERSTANDING

OBJECTIVE

- To develop a market mix model to observe the actual impact of different marketing variables over the year [July 2015-June 2016].
- To recommend the optimal budget allocation for different marketing levers for the next year i.e. 2016-2017.

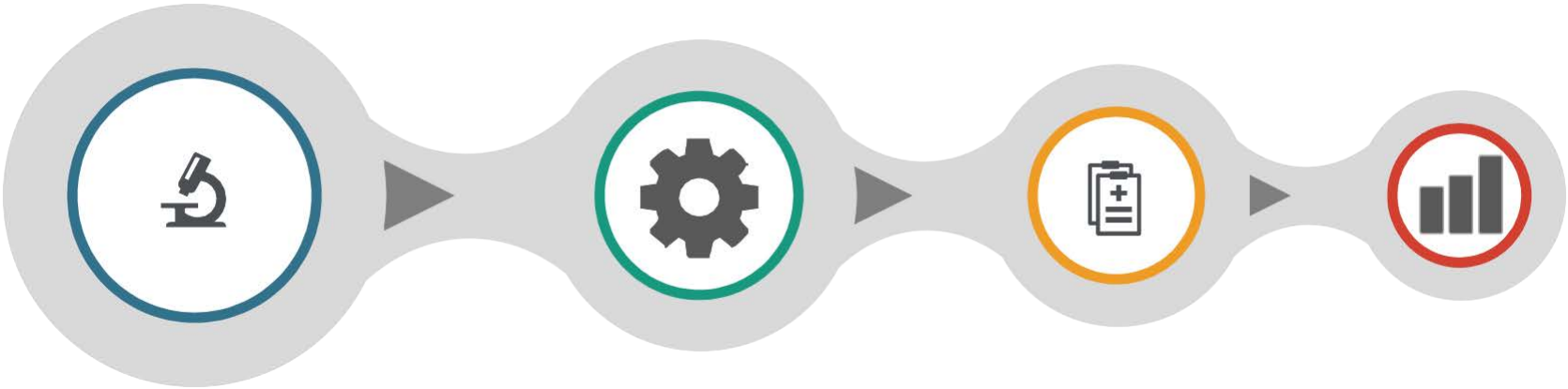
BACKGROUND

ElecKart is an e-commerce firm specialising in electronic products. To enhance their revenues, they have done significant investment in their marketing efforts, like promotions over last one year. They are about to create a marketing budget for the next year which includes spending on commercials, online campaigns, and pricing & promotion strategies. They want to reallocate their budget optimally across different marketing levers to improve the revenue response using Market Mix modelling.

CONSTRAINTS

Models have to be built at a weekly level

DATA FLOW



DATA UNDERSTANDING AND PREPARATION

(Identifying and checking for Missing values and other Data Quality issues)

DATA CLEANING

(Data Correction, Data Conversion and Data Manipulation)

DATA COMPUTATION

(Deriving new data from existing data)

DATA ANALYSIS

(Identifying most impactful channels for marketing spends.)

KPIS

The following KPIs are considered and their effect on Total Weekly GMV and Units Sold

- Avg MRP of products sold
- Avg List Price of products sold
- No of continuous days for which sale is carried out

DERIVED KPIS

The following derived KPIs are considered for considering the effect on Total Weekly GMV and Units Sold

- Discount on MRP(Promotion Price effect)

$$\%\ \text{discount offered}_{\text{ith week}} = \text{Discounted price}_{\text{ith week}} / \text{MRP}_{\text{ith week}} \text{ ------(wrt MRP)}$$

- Shelf price Inflation (Promotion Price effect)

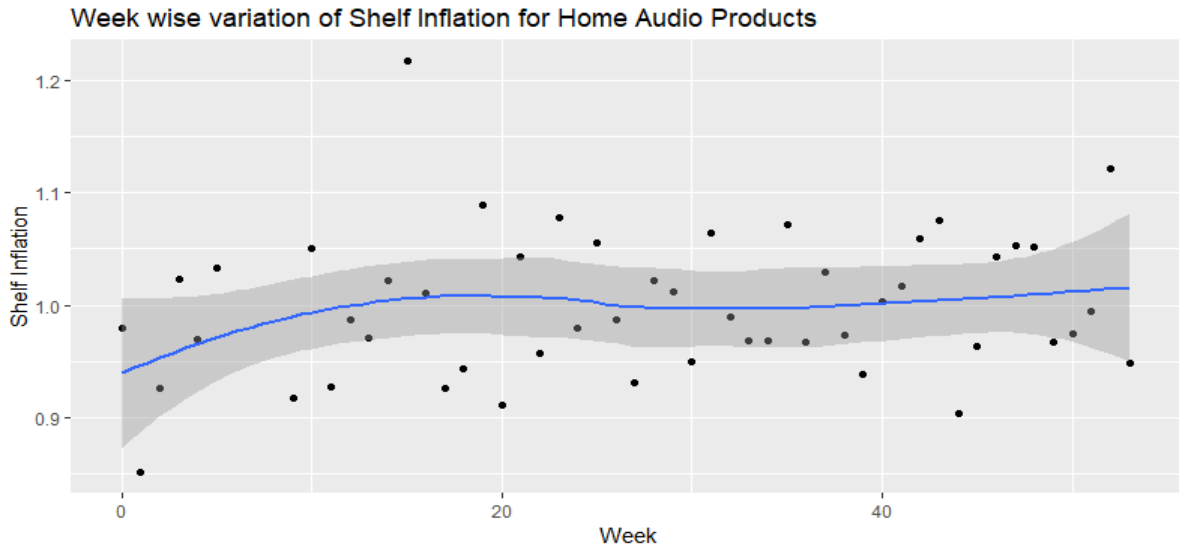
$$\text{Shelf price inflation}_{\text{ith week}} = \text{List price}_{\text{ith week}} / \text{List price}_{\text{(i-1)th week}}$$

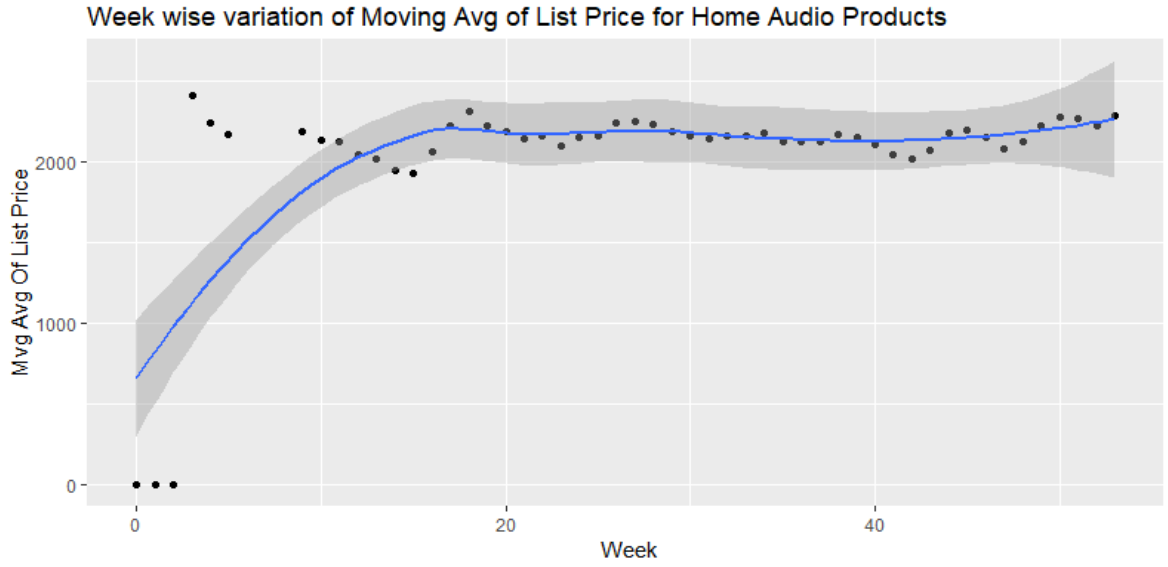
- Moving Average of the List Price for 3 weeks(Reference Price Effect)

DERIVED KPI'S
Home Audio Category

Observations –

1. Shelf inflation rate increases and decreases as per the week but it is in limit of 0.9 to 1.1
2. No sharp change in inflation rate
3. Moving average list price of Home Audio products is almost same (1930 – 2416)

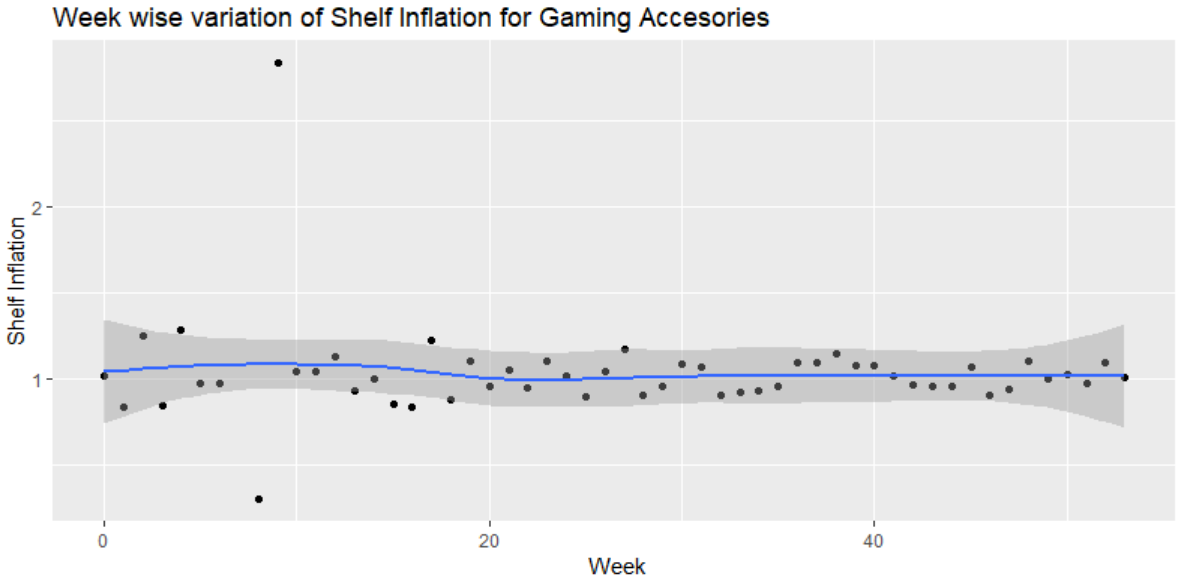


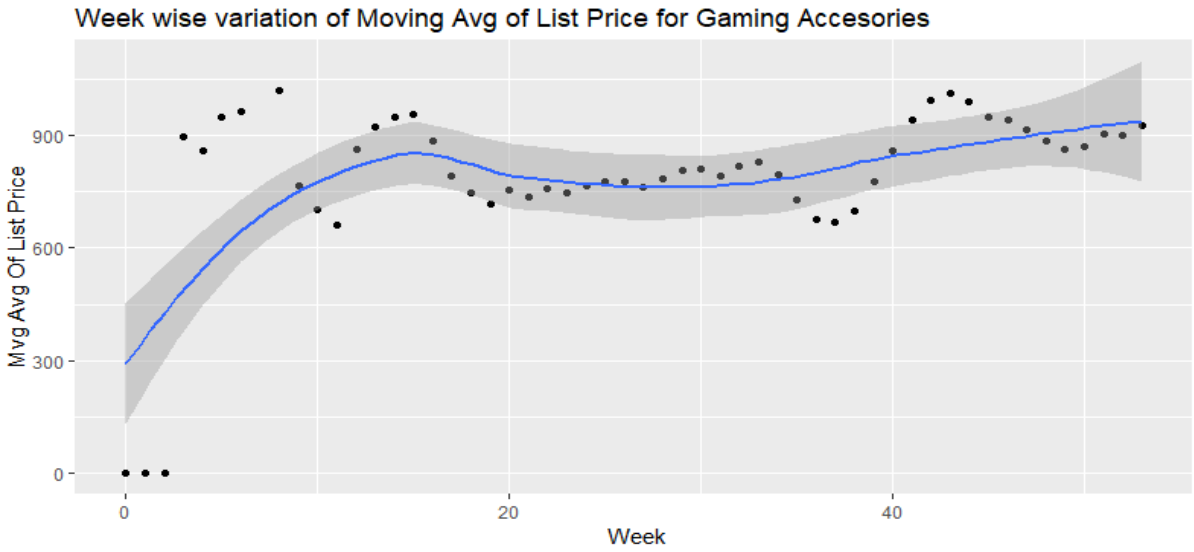


DERIVED KPI'S
Gaming Accessory

Observations –

1. Shelf inflation rate increases and decreases as per the week but it is in very small limit
2. No sharp change in inflation rate
3. Moving average list price of Home Audio products is varying
4. Moving average list price is significantly high and significantly low at sometimes (661 – 1018)

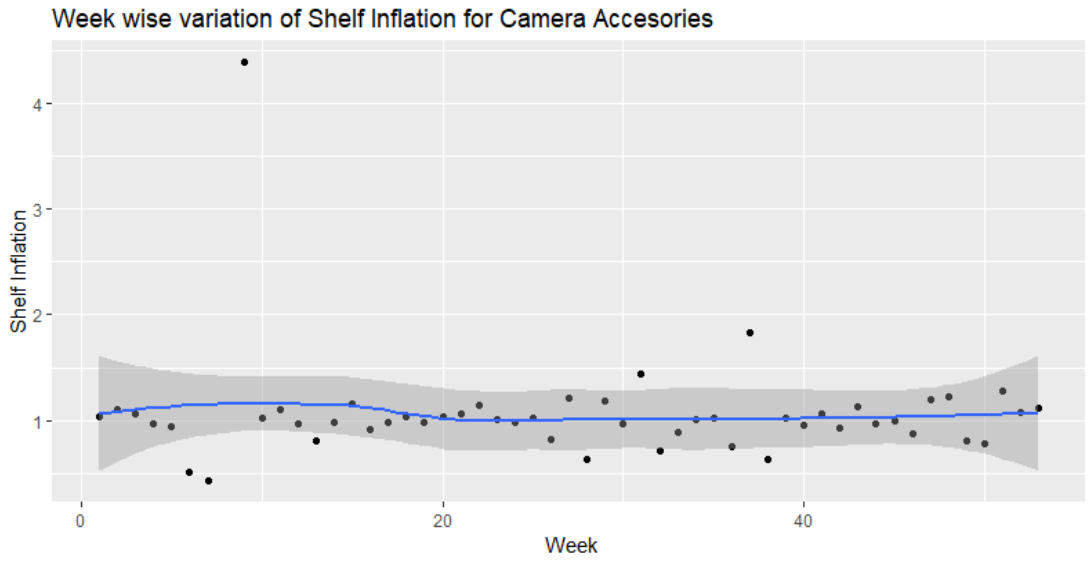


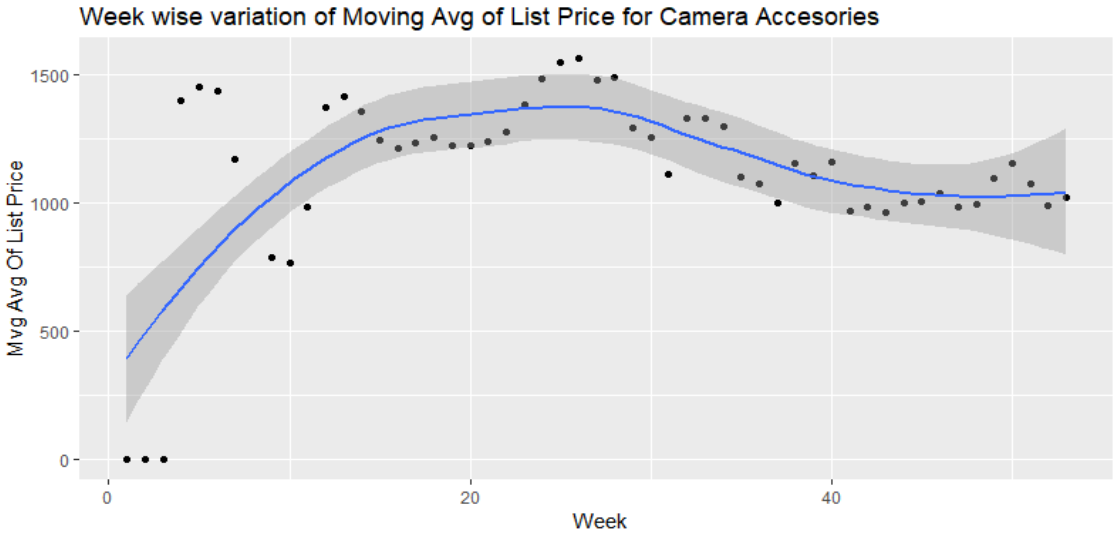


DERIVED KPI'S
Camera Accessory

Observations –

1. Shelf inflation rate increases and decreases as per the week but it is in very small limit
2. No sharp change in inflation rate
3. Moving average list price of Home Audio products is significantly varying
4. Moving average list price is significantly high and significantly low at sometimes (770 – 1567)





GAME ACCESSORY

Model	Significant Variables	Adjusted R-squared on training data	rsquare on test data	Cross validation (MSE)
Linear modelling	discount + procurement_sla + COD + Prepaid + TotalInvestment + Sponsorship + Radio	0.9881	0.9583796	6.32e+10
Distributed Lag Modelling	discount + listprice + procurement_sla + COD + Prepaid + ContentMarketing + Other + NPS + TotalGMV.4	0.997	0.9401661	0.0773
Multiplicative Modelling	units + listprice	1	0.99	7.77e-05
Multiplicative+Distributed Lag Modelling	discount + listprice + procurement_sla + COD + Prepaid + Digital + NPS	0.9954	0.85	0.592
Koyck	units + listprice + Prepaid + TV + Sponsorship + SEM + Radio	0.9999	0.97	0.0654

Multiplicative model is chosen as best model based on high r square and low MSE value.

CAMERA ACCESSORY

Model	Significant Variables	Adjusted R-squared on training data	rsquare on test data	Cross validation (MSE)
Linear modelling	units + discount + listprice	0.96	0.94	7.44e+11
Distributed Lag Modelling	discount + listprice + procurement_sla + COD + Prepaid + Other + NPS + TotalGMV.4	0.95	0.95	0.224
Multiplicative Modelling	units + listprice + TV	1	0.99	3.51e-05
Multiplicative+Distributed Lag Modelling	units + discount + listprice	0.95	0.94	1.29e-05
Koyck	units + listprice	1	0.98	0.0926

Multiplicative+ Distributed Lag model is chosen as best model based on high r square and low MSE value.

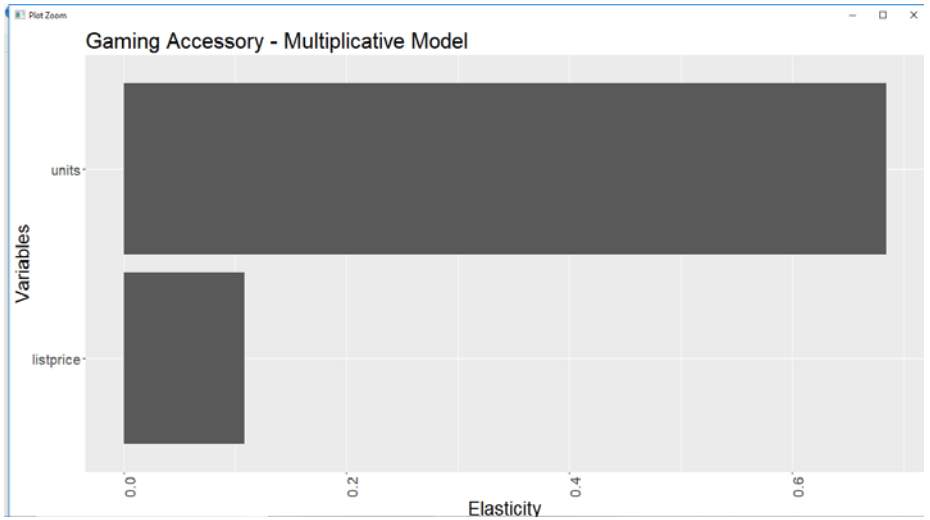
HOME AUDIO

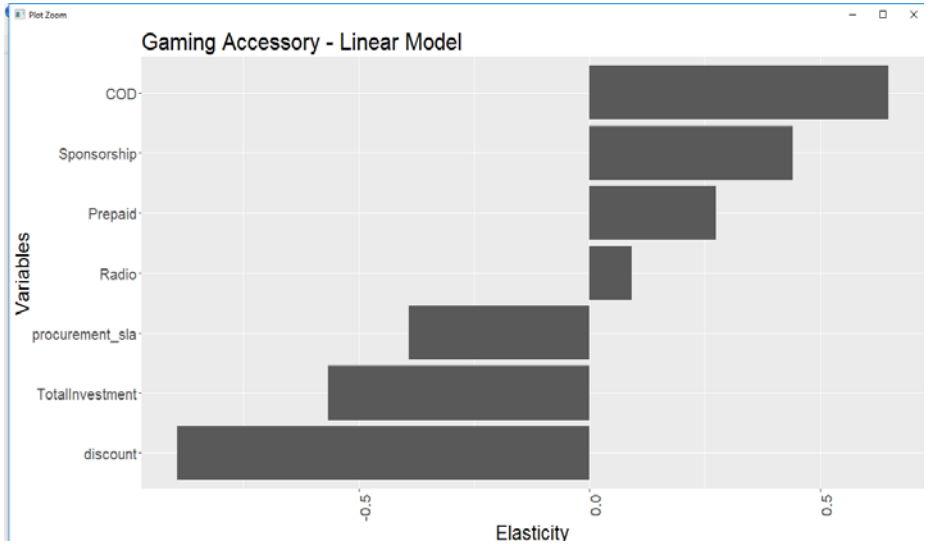
Model	Significant Variables	Adjusted R-squared on training data	rsquare on test data	Cross validation (MSE)
Linear modelling	discount + listprice + COD + Prepaid	0.9961	0.99	9.25e+10
Distributed Lag Modelling	units + listprice	0.9956	0.9917	0.0907
Multiplicative Modelling	units + listprice	1	0.98	2.71e-05
Multiplicative+Distributed Lag Modelling	units + listprice	0.9956	0.9917	6.62e-05
Koyck	units + listprice	1	0.99	0.00862

Multiplicative+ Distributed Lag model is chosen as best model based on high r square and low MSE value.

RECOMMENDATIONS BASED ON ELASTICITY GAME ACCESSORY

1. The figure represents elasticity of different significant variables with respect to revenue.
2. Positive elasticity means increasing the value of KPI would lead to increase in the revenue.
3. Units and listprice has positive impact on revenue.
4. Company should focus on managing units as it has highest impact on revenue.





RECOMMENDATIONS BASED ON ELASTICITY CAMERA ACCESSORY

1. The figure represents elasticity of different significant variables with respect to revenue.
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3. Units , listprice and discount has positive impact on revenue.
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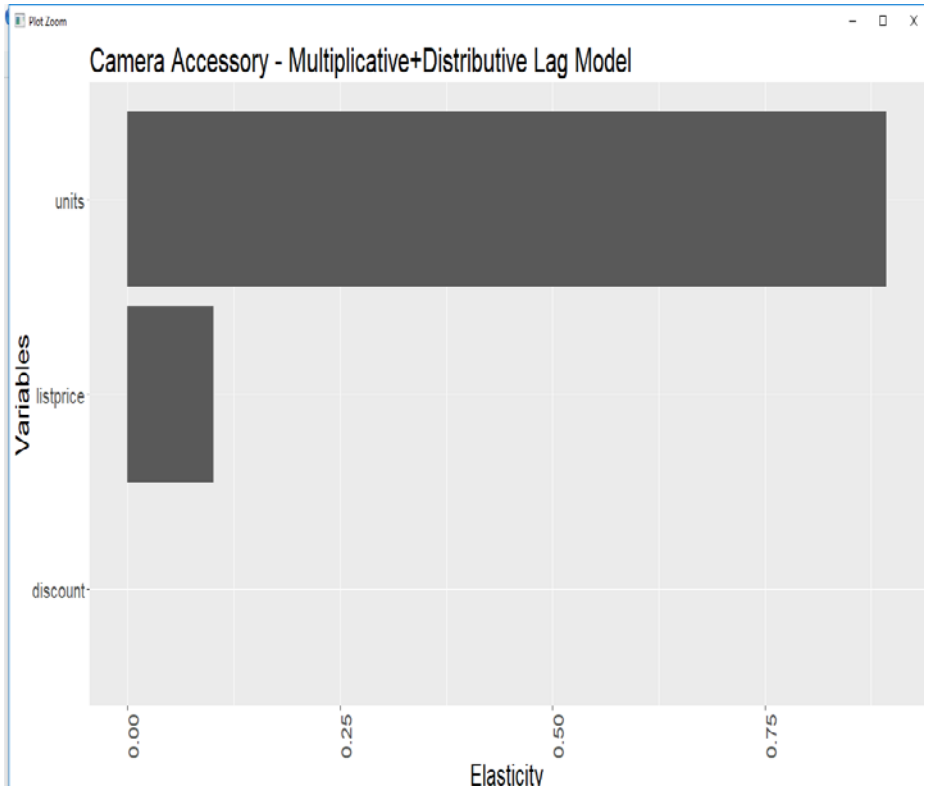

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