

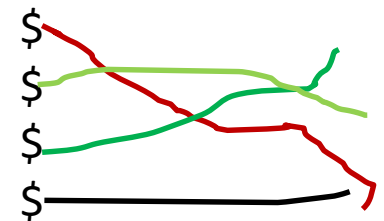
# Online Retail Sales Analysis

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# Business Objectives



- ❑ It is noticed in online retail – a dynamic price – strategy – is maintained – for better sales. With respect to same - study – made an attempt to understand – such behavior – through – price elasticity's.
- ❑ It is of much interest to understand – how – such practices – impacted their product sales/demand.
- ❑ Towards - current study - went ahead - 3 important objectives:
  - Does changes in price over time drove the sales, if, how they impacted quantities sold?
  - Does any brand exhibits high and low price elasticity's, if, define them?
  - And other possible relationships across the category.



# Data & Its Descriptivism

Data has been obtained from a online platform. It is a sample data of (mobile product category) for different brands (85), and their respective price (s) and sales for thirty days of a month. Data has 27872 observations/rows and 6 variables/columns as depicted in below table (1), which provide us about detail information on each variable starting with its format (in part 1 of the table.) that describes each variable's valid number of values (No. of Non-Missing Values), Missing values & its percentage (herein no missing at all), distinct values, (in part 2 of the table) their respective Minimum, Maximum, Mean, Median and Mode.

Table 1: Online Sales Data Summarization

Sl. No.	Variable Name	Format	No. of Non-Missing Values	Missing Values	% of Missing	Distinct Values
1	Day	Number	27872	0	0.00%	30
2	Brand	Number	27872	0	0.00%	84
3	Min.Sold.Price	Number	27872	0	0.00%	3493
4	Mean.Sold.Price	Number	27872	0	0.00%	10563
5	Max.Sold.Price	Number	27872	0	0.00%	3754
6	Tot.Sales	Number	27872	0	0.00%	307

Sl. No.	Variable Name	Minimum	Maximum	Mean	Median	Mode
1	Day	1.00	30.00	15.98	16.00	21.00
2	Brand	NA	NA	NA	NA	Micromax
3	Min.Sold.Price	-0.26	33991.75	526.16	276.74	295.75
4	Mean.Sold.Price	5.49	33997.50	570.06	299.10	202.49
5	Max.Sold.Price	7.99	64893.47	703.05	304.99	204.99
6	Tot.Sales	2.00	2121.00	15.04	3.00	2.00

**NA = Not Applicable**

# Data Preparation & Other Observations

- ❑ All the data has been obtained in csv format - which was loaded into R (version 3.4.1). Then data has been analyzed - further for pattern mining and the following observations are noted.
- ❑ From data it is observed that Micromax contributing to 31% of total sales, similarly, Acer (30%), Sony (13.5%), Panasonic (8%), Karbon (4%), Asus (3%), Intex (3%), Samsung (3%), Clekon (1%) and ZTE (1%). Top 10 contributing 92% of total 85 brands.
- ❑ Hence, study took top 10 brands for further analysis as per above percentages mentioned.



# Hypotheses

The current study proposes following three hypotheses for empirical assessment of the data:

**1. Null Hypothesis  $H_0$ :** Few brands might have high elasticity's.

i.e. sales/demand of few brands exhibit more elastic demand.

**&**

**Alternate Hypothesis  $H_A$ :** Few brand might have low elasticity's.

i.e. sales/demand of few brands exhibit less elastic demand.

**2. Null Hypothesis  $H_0$ :** Brands might have cross elasticity's.

i.e. sales/demand of few brands exhibit cross elasticity.

**&**

**Alternate Hypothesis  $H_A$ :** Brand might have no cross elasticity's.

i.e. sales/demand of few brands exhibit no cross elasticity.

# Discussion of Results

Table 1: Regression Results

Variable	Coefficient	P-Value	Adj-R-Squared	Brand
Minimum Sold Price	-1.74	<0.01	27.12%	Micromax
Mean Sold Price	-0.71	<0.05	16.71%	Panasonic
Maximum Sold Price	0.68	<0.01	24.38%	Samsung

- ❑ Now, from the above regression output table, it is evident from p-values all three brands at their respective prices are significant.
- ❑ The above result infers that overall demand are either driven by higher or lower prices.
- ❑ The larger negative coefficient clearly explains that being data belong to the emerging brand, we see larger demand at lower prices (Micromax).
- ❑ Also, there seems to be some brand value impact as explained by the coefficient of Maximum Sold Price which is significant with positive coefficient sign indicating that sales exist even at higher prices i.e. nothing but characteristic of branded good (Samsung).
- ❑ Coming to other important outputs description, the Micromax estimated model has R-Squared (explanatory power) of 27.12%.
- ❑ Also, it is observed that Panasonic as has good sales at its average sale price.

# Benefits of our model to Business

- ❑ It is observed from the competitive online retailer sales - though for overall sales across 85 brands average competitive prices didn't showed much impact – yet – some brand value was observed at **higher prices** (Samsung) and some at lower competitive prices (Micromax). Thus, brands can either look at developing high-end and low-end products for this market.
- ❑ Also – it is observed that brand Micromax dominated the competitive online retailer sales for the data employed, where other brands failed to explain much from the employed data.
- ❑ Finally – we observed some cross elasticity across the three brand viz. Micromax, Acer and Sony, where it is observed Acer and Sony to be immediate competitors, however model doesn't turned out to be a very good explanatory power.

