Analytics Challenge

Pricing strategy for grocery retailer

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1. **Introduction**

2. **Data Description and Analysis**
   a. Trends & Seasonality
   b. Price Elasticity

3. **Recommendations**

1. Introduction

Demand forecasting supports corporate-wide planning activities
Pricing strategy leverages business market share and profitability

- Capacity planning

- Marketing plans

- Workforce planning

- Financial planning and budgeting

- Inventory planning

- Profit margin

- Sales volume

- Market share

- Brand position

- Consumer segments

- Market structure

Objectives

- Forecasting weekly sales volumes
- Analyse the impact of pricing on sales volume
- Recommendation on pricing strategy

Datasets

- Weekly sales data between 2015 and 2016
- Historic price change data for each product
- Information on the product hierarchy

Toolkit: python™ jupyter

Executive Summary

Trends & Seasonality

- **An increasing trend** for sale's volume was found in the data
- A clear **seasonal increase** in sale's volume shows in **Summer** and **Winter**

Price Elasticity

- **Country B** is highly **elastic** compare to country A.
- **Online channel** is highly **elastic** compare to Store channel
- Commodity **group 606565a1** is the **most elastic** group

2. Data Description and Analysis
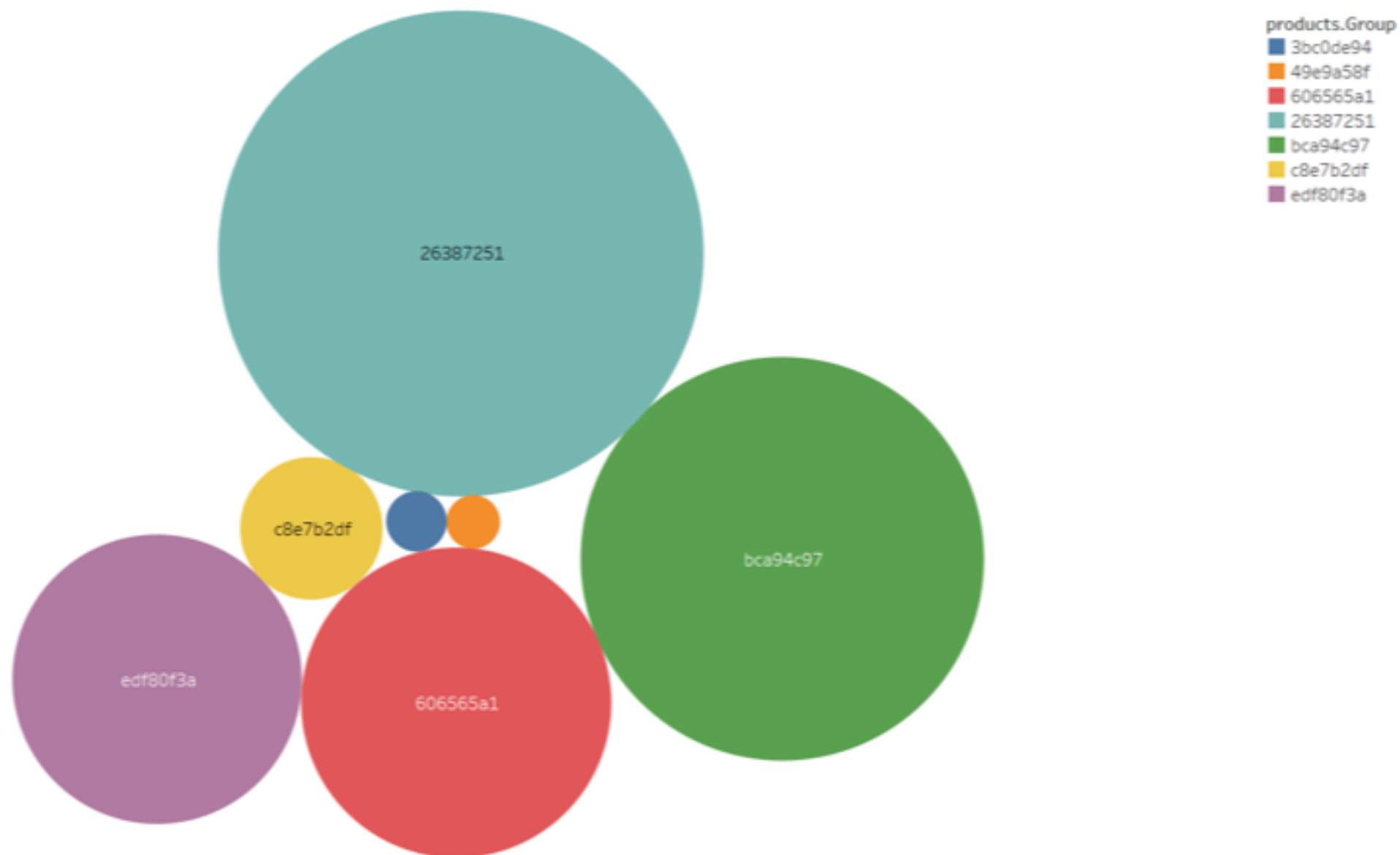
Overview of the business

Operate in A and B countries

- A country has store channel
- B country has both store and online channels

Product's price range from £10 to £40

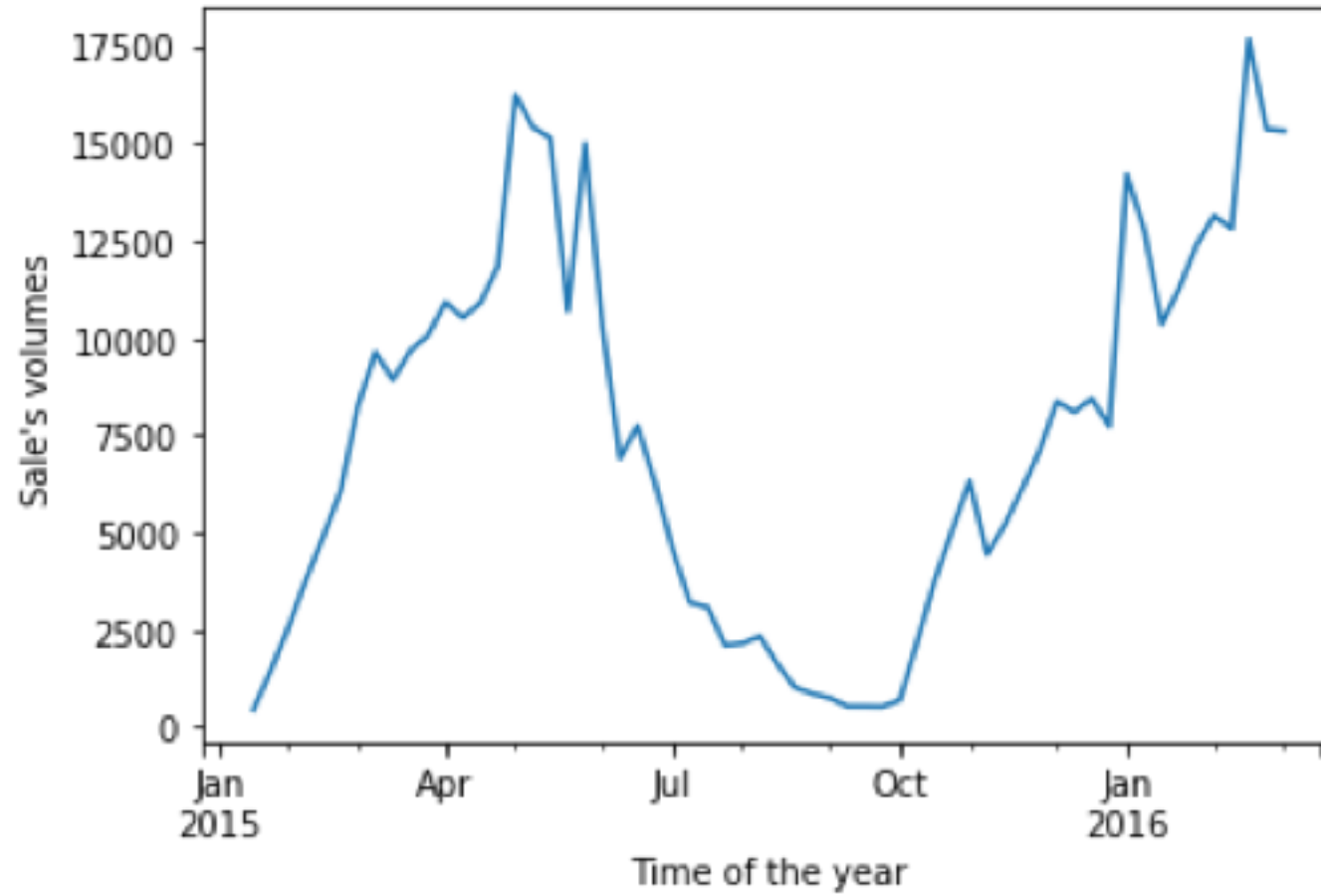Our products are categorized into 7 big groups

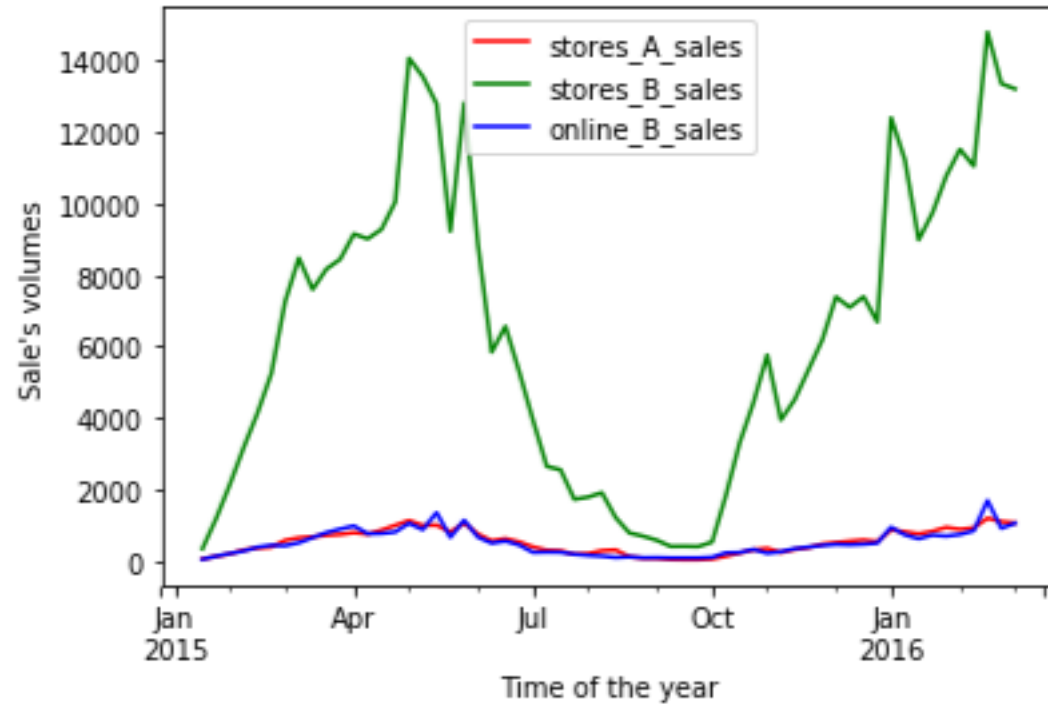# How large is each of the 7 main product groups?

products.Group
- 3bc0de94
- 49e9a58f
- 606565a1
- 26387251
- bca94c97
- c8e7b2df
- edf80f3a

26387251

c8e7b2df

bca94c97

edf80f3a

606565a1

Our products are categorized into 7 big groups.
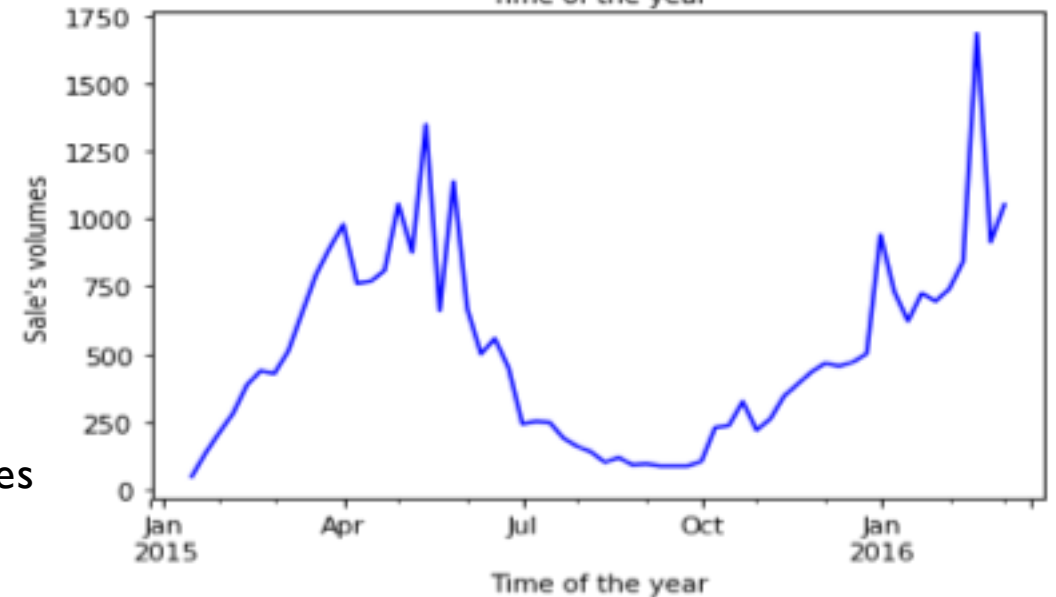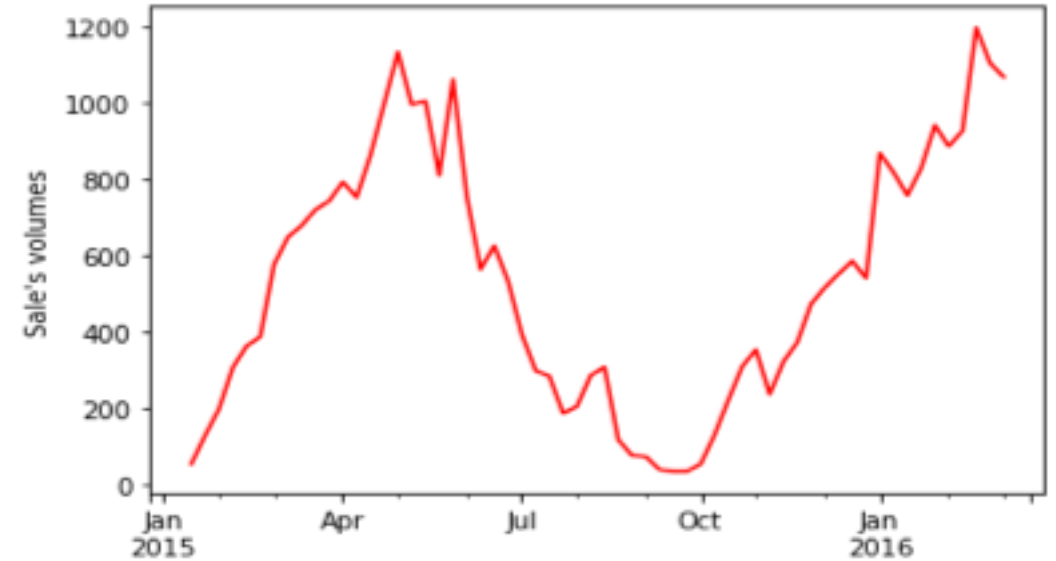
a. Trends & Seasonality

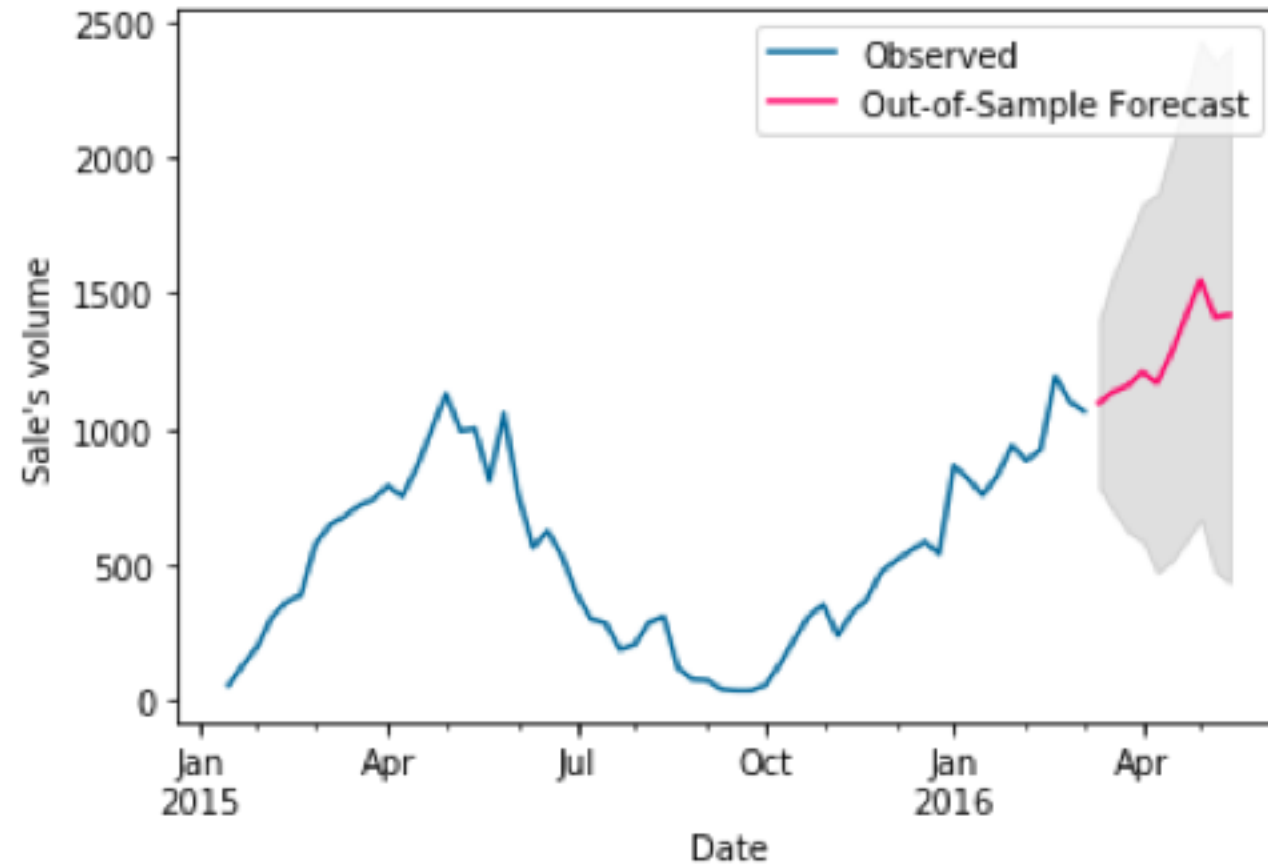# A strong seasonal increase in sale's volume during Summer and Winter

Trend & seasonality decomposition

- A strong seasonality pattern across the business
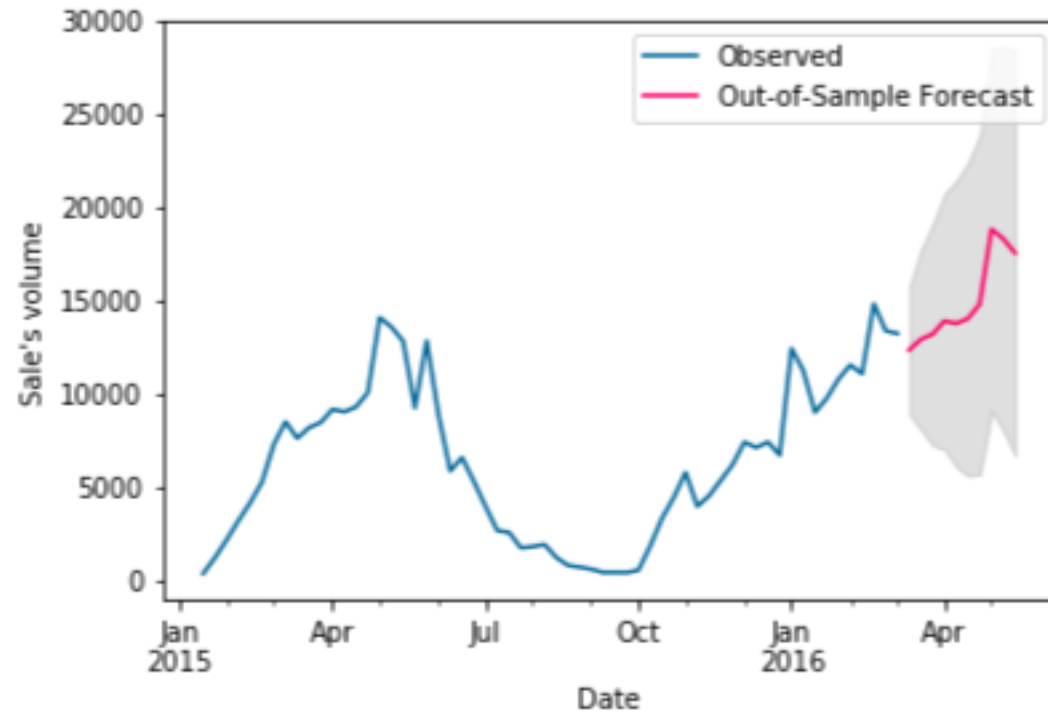- Country B in store has the most contribution to sales volumes

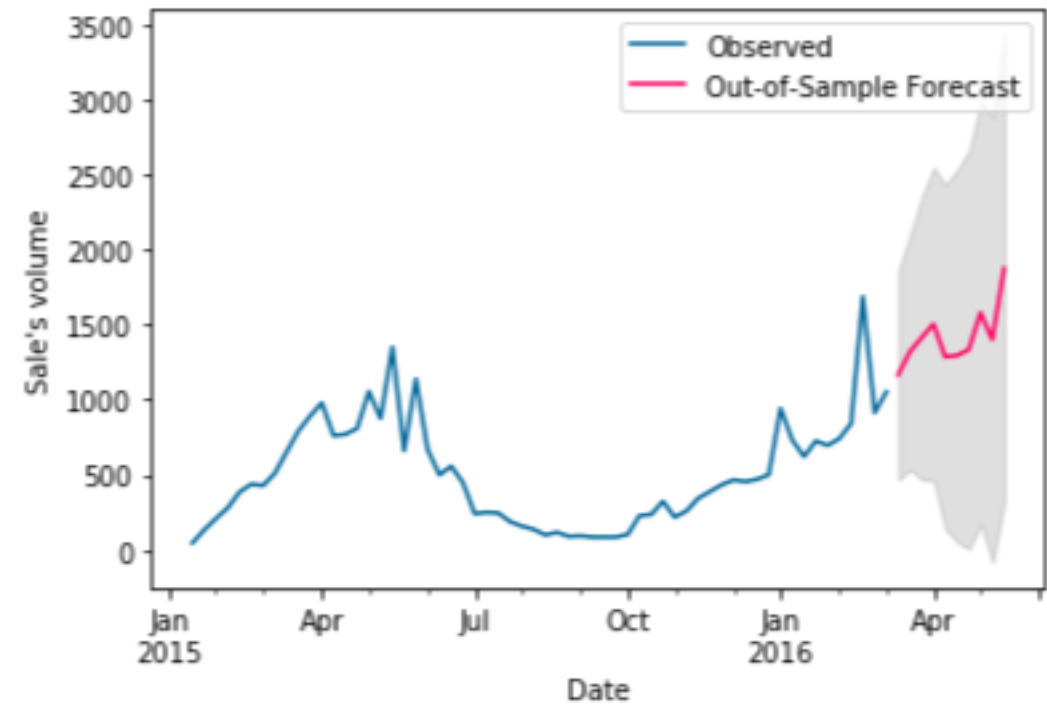# Country A store sale's volume forecast in the next 10 weeks

Country B sales volume forecast in the next 10 weeks

Store sales volume forecast

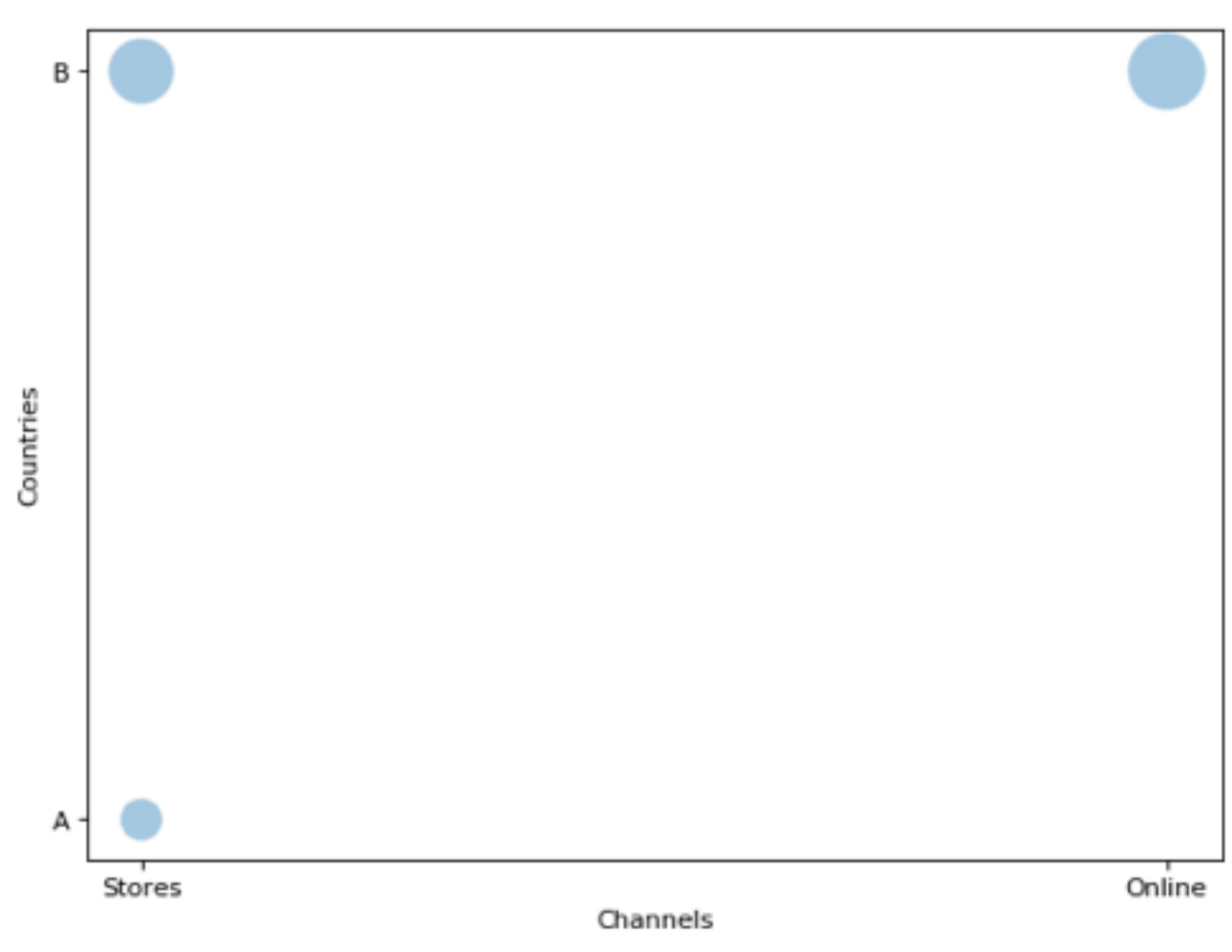Online sales volume forecast

b. Price Elasticity

Terminology

Elasticity interpretation:

- Elasticity of E = -1.2 means that a price increase of 1% will lead to a reduction of quantity sold of 1.2%
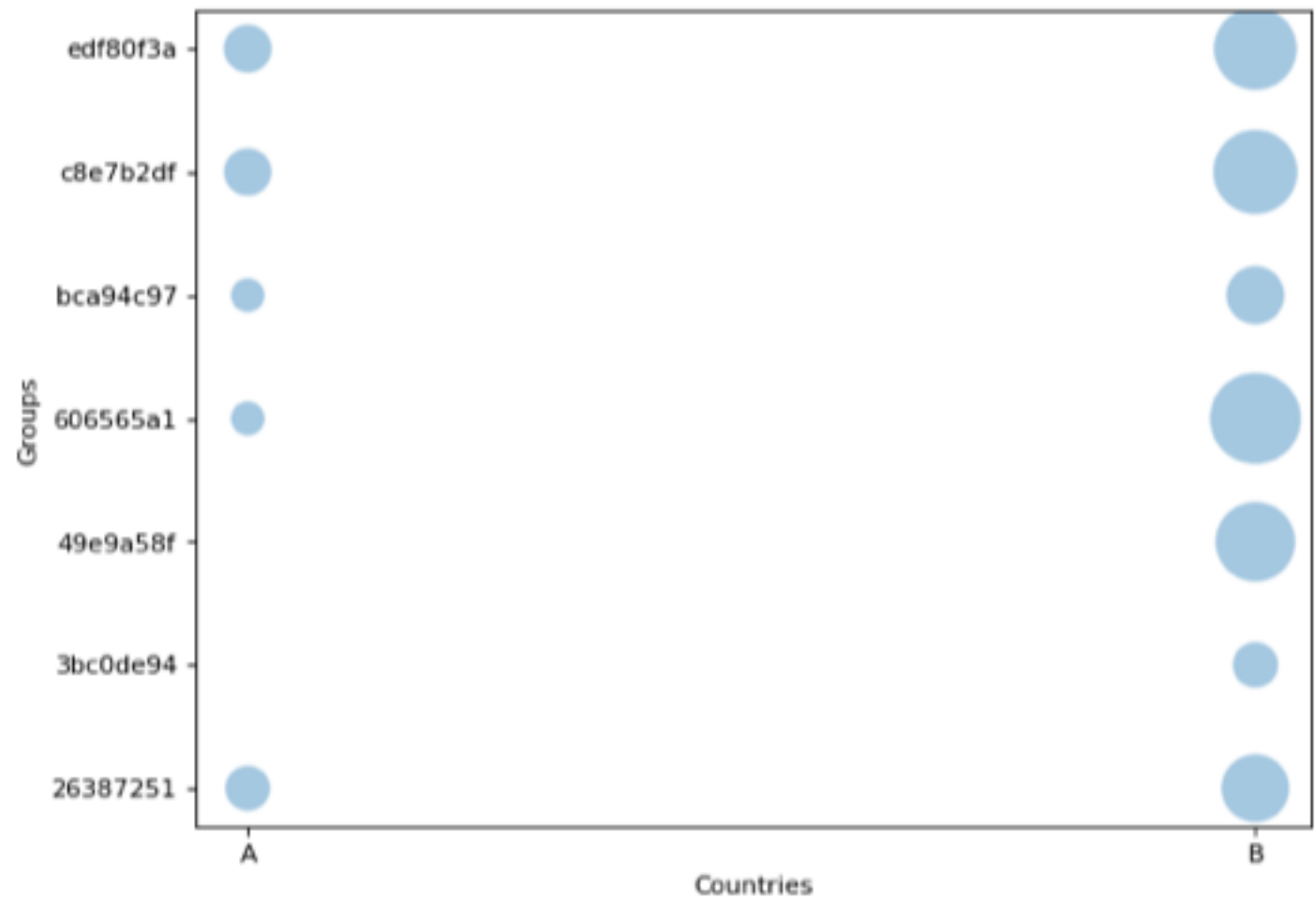
Threshold:

- Elastic ($|E| > 1$)
- Inelastic ($|E| < 1$)

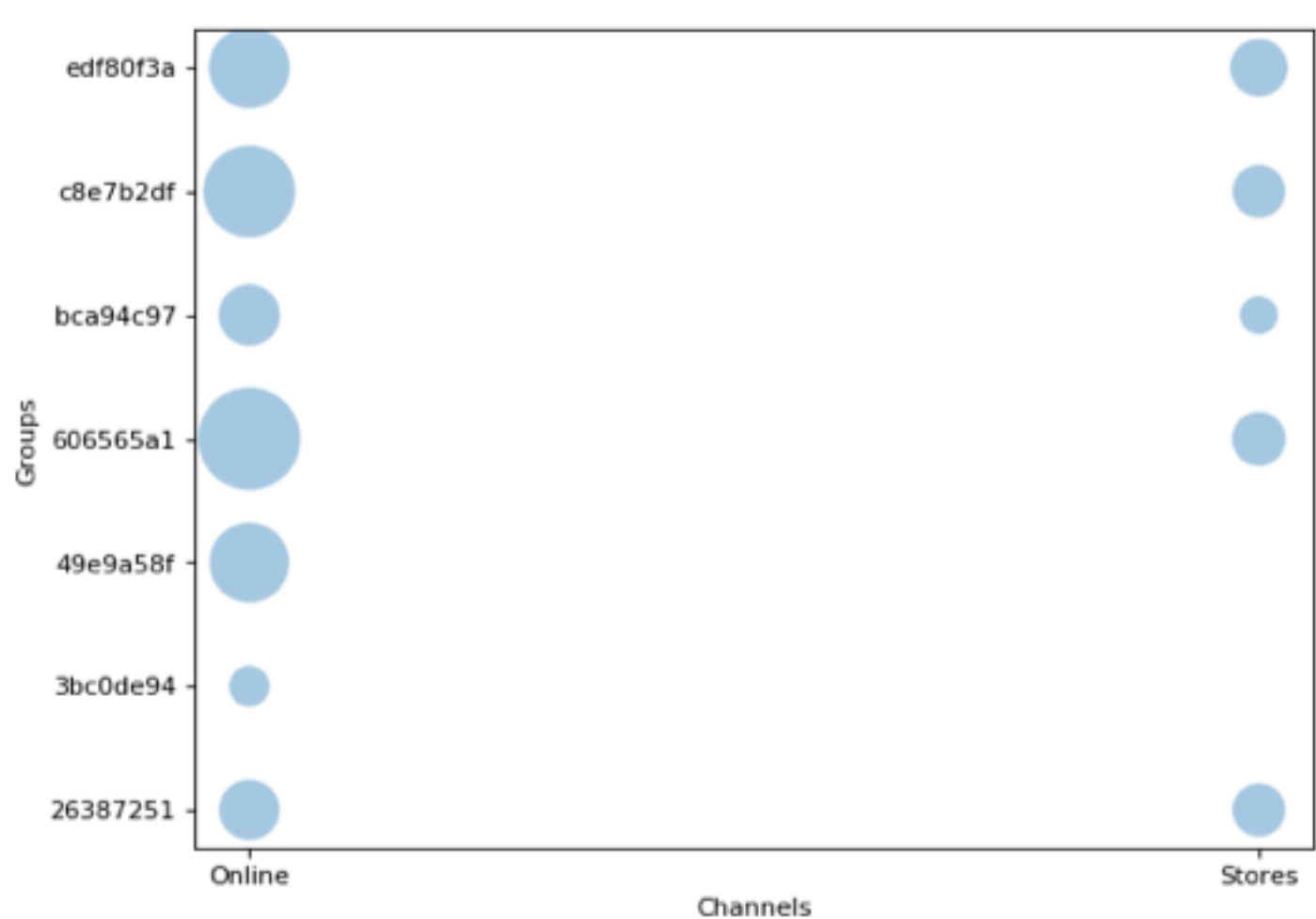# Country B shows higher price elasticity compared to country A, especially for Online sale's channel

Group 606565a1 in country B is the most elastic group amongst others
Group edf80f3a in country A is the most elastics group in the country

Group 606565a1 online is the most elastic group
Group edf80f3a store is the most elastics group in the channel

3. Recommendation on pricing strategy

Pricing strategy – object to maximize market share

1. Reduce product price in **country B**, especially in **Online Channel**

   - price deduction of 1% will lead to an increase of quantity sold of 9.5% on average

2. Decrease price of group **606565a1** in **country B**,

   - price deduction of 1% will lead to an increase of quantity sold of 13.6% on average

3. Decrease price of group **606565a1** in **Online Channel**

   - price deduction of 1% will lead to an increase of quantity sold of 21.3% on average

The analysis conducted can be used as a starting point for additional research and a discussion of future improvements

Limitations
- Forecasting model can be improved via **rolling** algorithm and **validation**
- Price elasticity of demand does **not account** for **other factors** (e.g., competitors price change) and we cannot hold everything constant

Additional Research
- A pricing strategy for **revenue** can be conducted – if it is a business objective
- The data did not allow an pricing strategy analysis on **profitability**, which is a vital aspect for any business
- Additional information about **competitors** would allow us to compute **cross effects** (how the actions of others impact our sales)
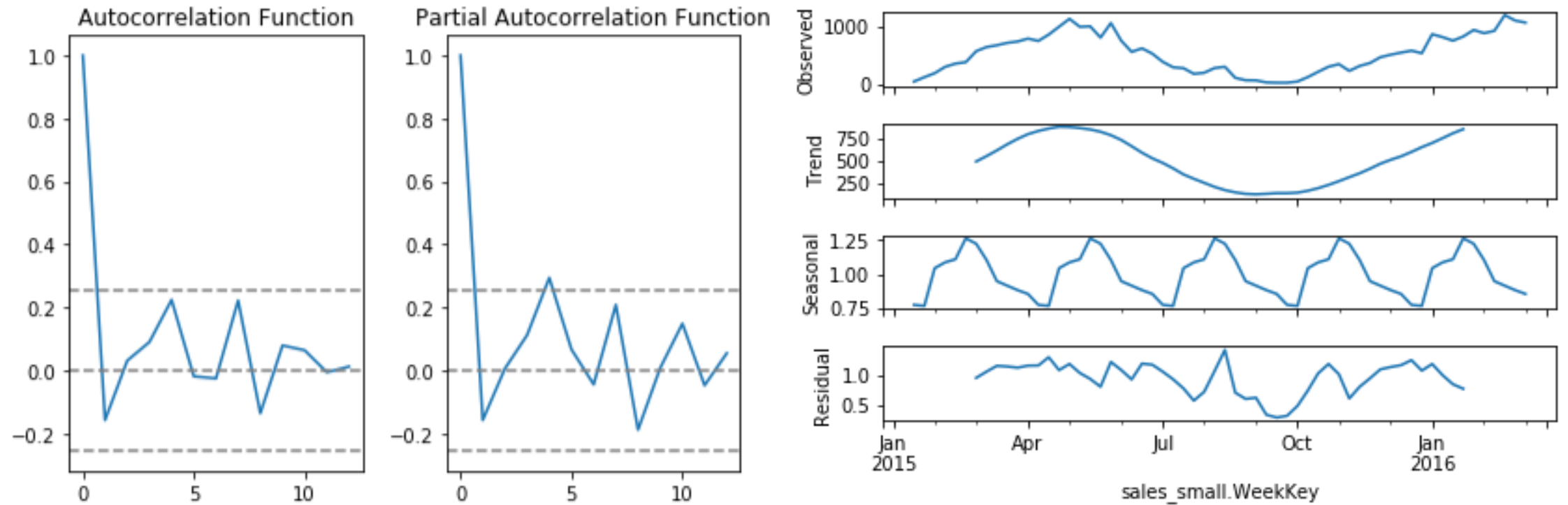- **Clout** and **vulnerability** analysis on its products

Discussion
- Is it possible to obtain **profit margin** of each selling product?
- Is it possible to conduct a market research to obtain competitor's pricing strategy?

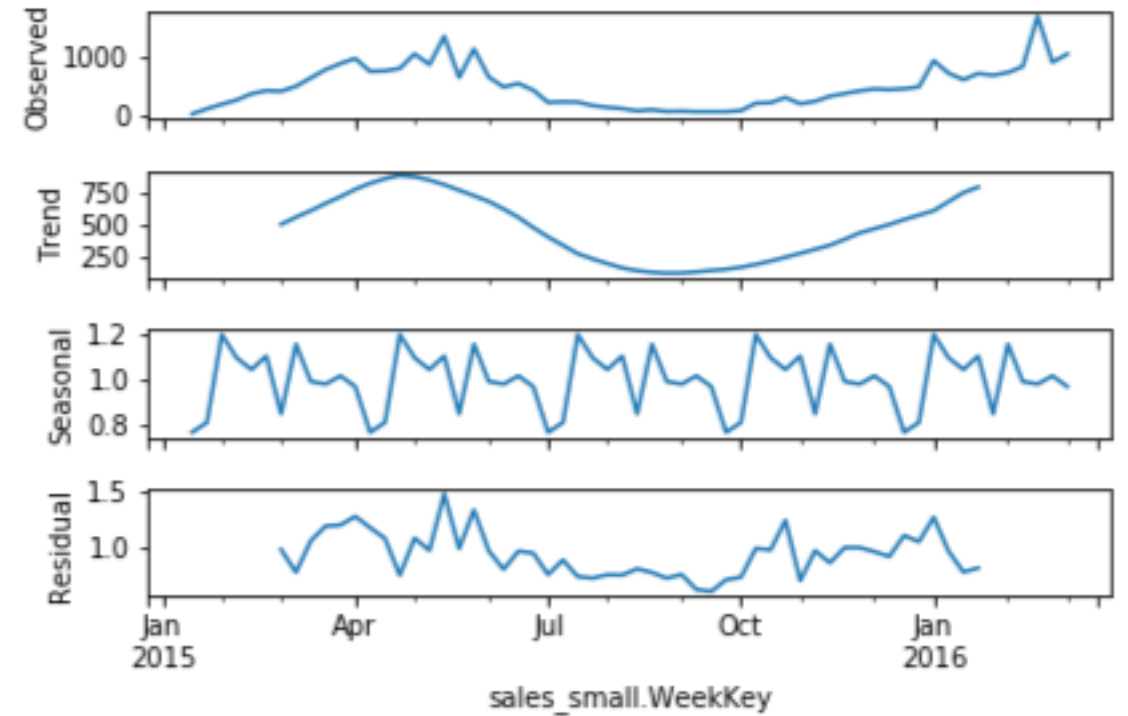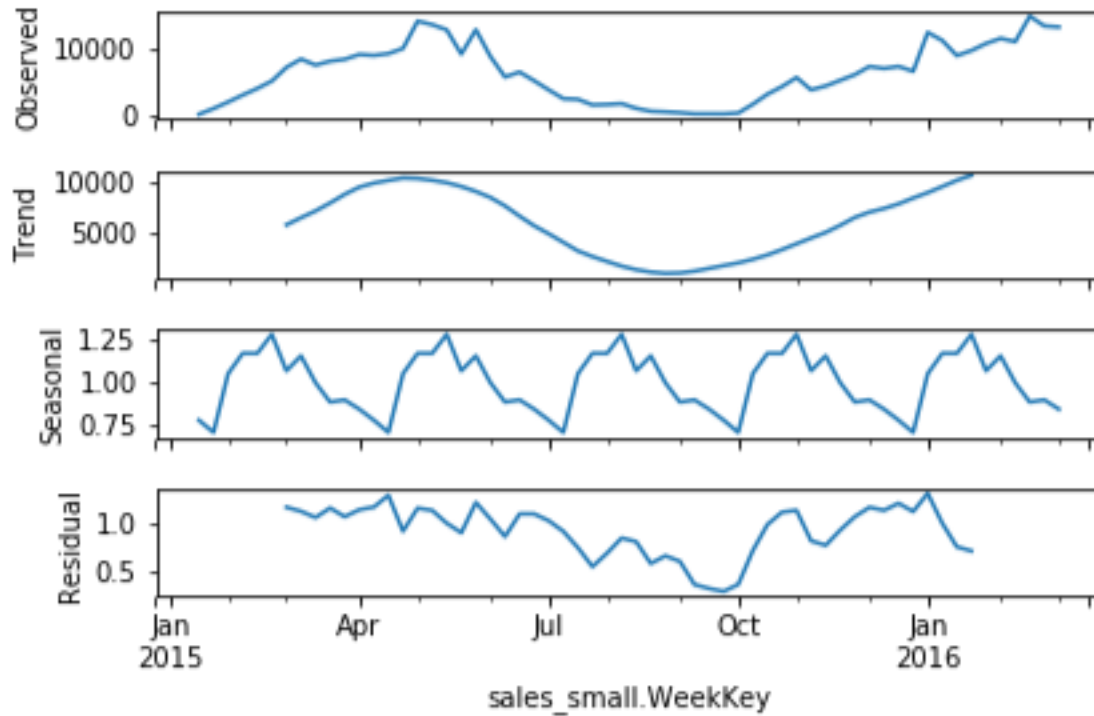# Thank you for your attention

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References

Country A, Channel Store

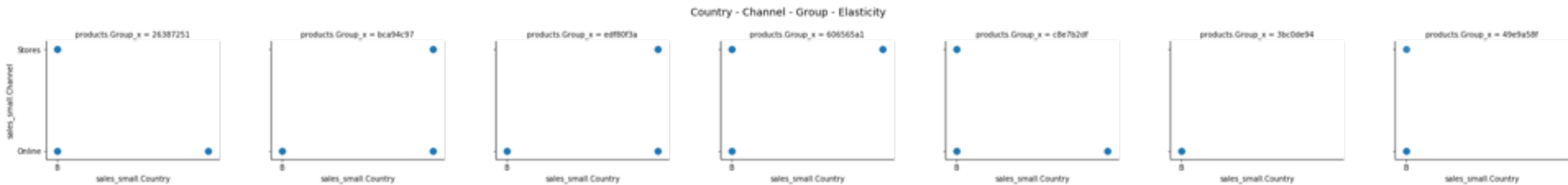# References

Country B, Channel Store & Online

References

	sales_small.Country	sales_small.Channel	elasticity
0	A	Stores	-2.854687
1	B	Online	-9.531849
2	B	Stores	-6.789624

References

	products.Group_x	sales_small.Channel	elasticity
0	26387251	Online	-7.529180
1	26387251	Stores	-5.839701
2	3bc0de94	Online	-3.465628
3	49e9a58f	Online	-13.006524
4	49e9a58f	Stores	0.000000
5	606565a1	Online	-21.294520
6	606565a1	Stores	-6.012278
7	bca94c97	Online	-7.710534
8	bca94c97	Stores	-3.024274
9	c8e7b2df	Online	-17.168781
10	c8e7b2df	Stores	-5.792964
11	edf80f3a	Online	-13.417007
12	edf80f3a	Stores	-6.886033

	products.Group_x	sales_small.Country	elasticity
0	26387251	A	-3.377693
1	26387251	B	-7.597680
2	3bc0de94	B	-3.465628
3	49e9a58f	B	-10.405219
4	606565a1	A	-1.964153
5	606565a1	B	-13.586743
6	bca94c97	A	-1.943494
7	bca94c97	B	-5.598405
8	c8e7b2df	A	-3.776165
9	c8e7b2df	B	-11.595846
10	edf80f3a	A	-3.840808
11	edf80f3a	B	-11.246058

References

Country - Channel - Group - Elasticity

The end