# FTD_Profitability Final

## FTD Profitability Analysis and Pricing Strategy

## Introduction and Background

In order to determine the most suitable selling price for various floral arrangements, we embarked on a journey to develop a pricing model. The main objective was to ensure that the margins remained relatively normalized across different arrangements, regardless of their cost of goods (COGS).

## Initial Approach and Analysis

Our initial approach was to explore a parabolic pricing model, with the formula:

$$\text{SRP} = \text{COGS} + \alpha \times \text{COGS} \times (1 - \beta \times \text{COGS})$$

However, this model led to extreme margins, especially for arrangements with a high COGS. This led to limited returns on items with COGS above $40.

## Original Pricing

### - Data Overview

Two datasets were provided for analysis: one for "Everyday" (EDay) arrangements and another for "Sympathy" arrangements. Each dataset contained information about the SKU, description, COGS, and the selling retail price (SRP).

### - Observations

Upon preliminary analysis, it was evident that the pricing strategy was not consistent across the board. Some arrangements with similar COGS had widely different SRPs, leading to inconsistent margins.

# Objective

The primary goal was to develop a pricing strategy that:

- Ensures profitability.
- Reduces the variability of margins.
- Offers competitive prices to customers.

# Methods Explored

Various pricing models were explored to achieve the objectives:

## - Linear Pricing Model

A straightforward approach where the SRP is directly proportional to the COGS.

## - Parabolic Pricing Model

Designed to moderate the margins, especially for higher COGS. However, it resulted in extreme SRPs for some SKUs.

## - Logarithmic Pricing Model

Introduced to control the rapid increase in SRPs for higher COGS. This model achieved more controlled SRPs, but still didn't align closely with the original pricing for mid-range COGS.

## - Piecewise Pricing Model

A combination of linear and logarithmic models. For COGS below a certain threshold, a linear model is applied. Beyond that threshold, a logarithmic model takes over. This approach allowed for more flexibility in pricing and better alignment with the original SRPs.

# Final Model

# Final Piecewise Model

Our final model was a piecewise function that utilized a linear model for products up to a certain COGS and a logarithmic model beyond that point. The transition point for the piecewise function was determined to be a COGS of $40.

For "Sympathy":

- For COGS $\leq$ $40:

$$\text{SRP} = 2.5 \times \text{COGS}$$

- For COGS $>$ $40:

$$\text{SRP} = 2.5 \times 40 + 25 \times \log(\text{COGS} - 39)$$

For "EDay":

- For COGS $\leq$ $40:

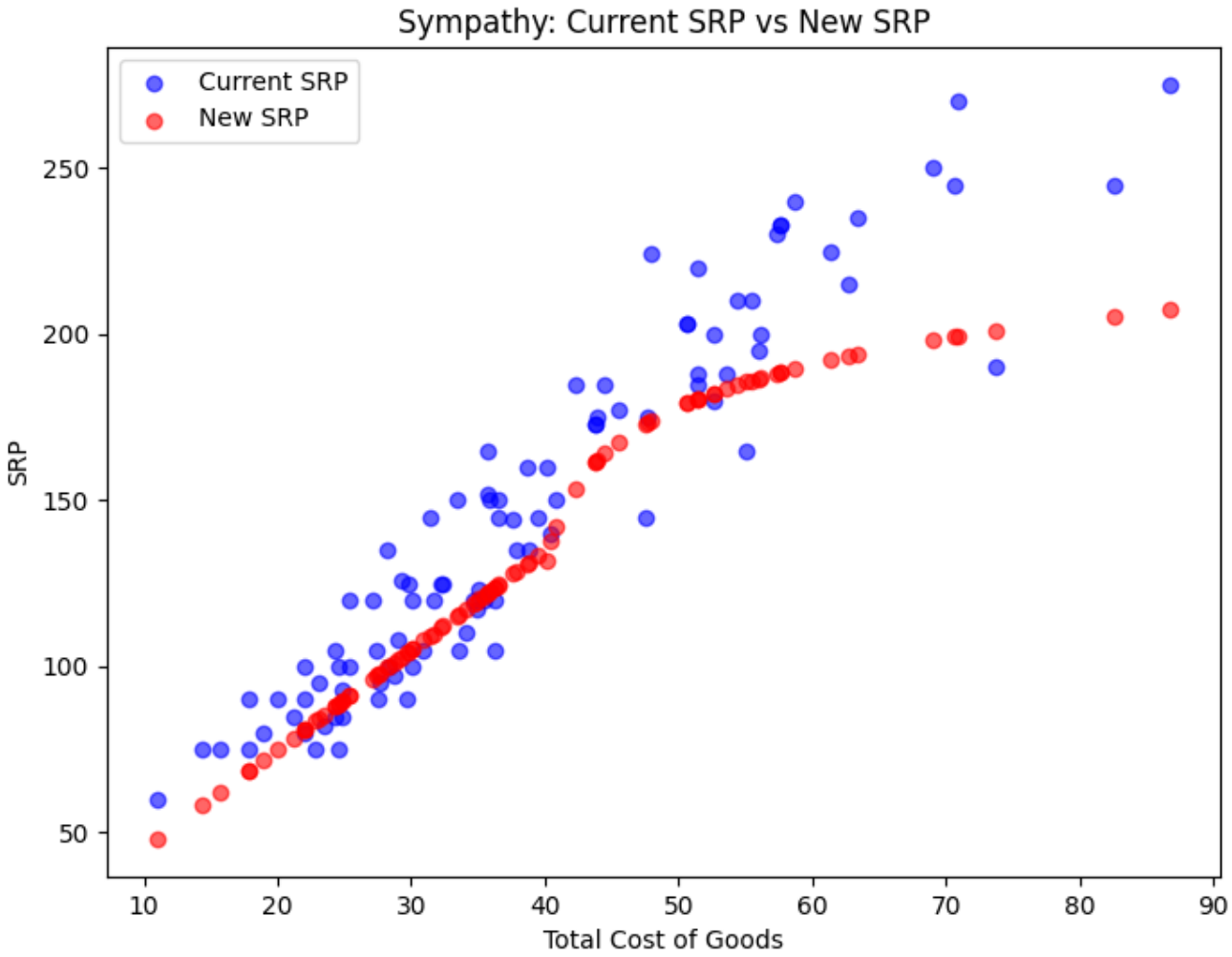
$$\text{SRP} = 2.8 \times \text{COGS}$$

- For COGS $>$ $40:

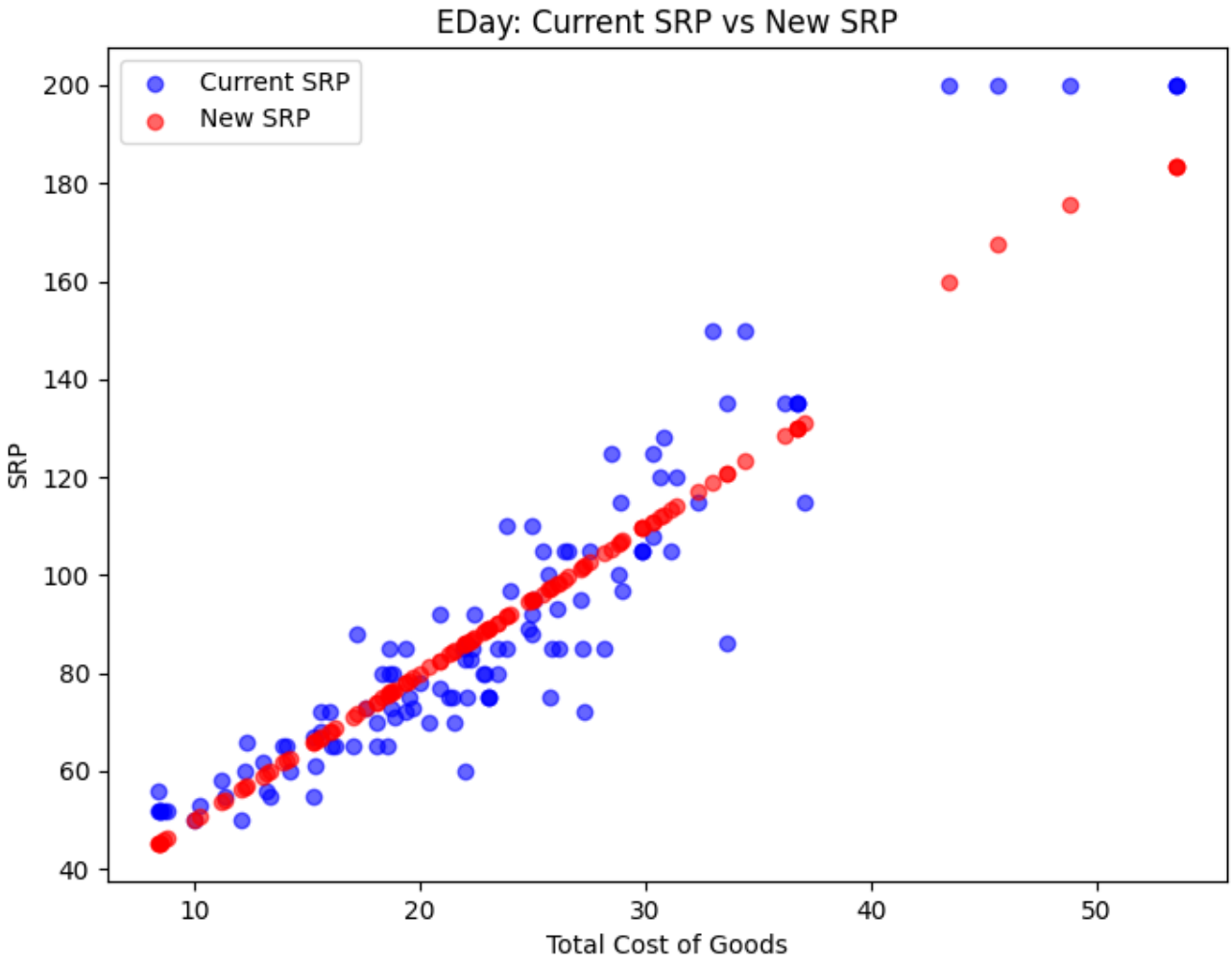
$$\text{SRP} = 2.8 \times 40 + 28 \times \log(\text{COGS} - 39)$$

# Graphical Representation

## Sympathy: Current SRP vs New SRP




## EDay: Current SRP vs New SRP




## - Sample Arrangements Comparison

## Sympathy Sample Arrangements:

| SKU | Total Cost of Goods | Old SRP | Old Margin | New SRP | New Margin |
|---|---|---|---|---|---|
| S5286d | 27.53 | 90 | 69.4% | 68.83 | 60.0% |
| S5321p | 35.75 | 152 | 76.5% | 89.38 | 60.0% |
| S6-4447Fd | 50.66 | 203 | 75.0% | 161.40 | 68.6% |
| S5450s | 11.03 | 60 | 81.6% | 27.58 | 60.0% |
| S5292s | 86.74 | 275 | 68.5% | 196.64 | 55.9% |

## EDay Sample Arrangements:

| SKU | Total Cost of Goods | Old SRP | Old Margin | New SRP | New Margin |
|---|---|---|---|---|---|
| C5379d | 17.06 | 65 | 73.8% | 47.77 | 64.3% |
| CGYp | 22.44 | 92 | 75.6% | 62.83 | 64.3% |
| CBUe | 28.48 | 125 | 77.2% | 79.74 | 64.3% |
| FLKs | 8.42 | 52 | 83.8% | 23.58 | 64.3% |
| E5440e | 53.52 | 200 | 73.2% | 186.91 | 71.4% |

## 6. Conclusion

The piecewise pricing model achieves a balance between profitability and competitive pricing. It aligns closely with the original SRPs for mid-range COGS while ensuring more controlled pricing for high-end arrangements. This strategy ensures that the margins are more consistent across different arrangements, leading to a more predictable profitability model.