Outsourcing, Near-sourcing, and Supply Chain Flexibility in the Apparel Industry (A)

Team 4 – Beta

Akshith Moyya, Ojal Gangwal, Tirth Modi, Varalaxmi Gangane

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California State University Long Beach

Dr. Ming Chen

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Introduction and Problem Description

Introduction

Known for their exceptional craftsmanship, Veizenburg's family was the one-stop destination for the people of Vienna when it came to purchasing shirts. Timm Veizenburg, who is passionate about resurrecting the family business, launched his online storefront in 2011, which was quickly followed by pop-up shops in well-known shopping locations in North America once or twice a year for men's shirts. Veizenburg, whose company was primarily online, instructed his customer analytics team to review web publications, fashion magazines, and shows (as well as the company's own website traffic) and target specific clients with tailored dress shirt offers. The company didn't use traditional media for advertising; instead, it displayed banner ads, bid on search terms, and occasionally appeared at gatherings where well-dressed men were expected to go.

Effectively, Veizenburg had two product lines. The first were the "must-haves," which were always "in the collection" in a range of styles, fits, and sizes, such as white or light-blue shins. The second group was the LEC, which featured bolder, more imaginative looks created with unusual textiles and design components. These collections were only accessible for a brief time (typically two to four weeks). The majority of the materials and finishing touches (buttons, linings, etc.) for both seasons came from England and Italy. For his merchandise, his partner's manufacturing partners had capacity allowed up to 3,000 LEC shirts in the specified variety of styles and sizes to be made within a three-week period. The shirts were packaged in Ukraine and shipped by air cargo to the company warehouse on the East Coast of the United States. From there, the shirts were delivered by express post to customers.

Problem Statement

In its second year the LEC project, it is clear from the sales report that many of the LEC shirts remained unsold. Various tactics were implemented to clear this inventory selected customers were offered a "buy two, get one free" promotion. Widespread markdowns as practiced in the retail industry were not considered, as they could tarnish the brand's prestige and reputation for high quality. With the limited promotions offered, the average net price per LEC shirt was $135.

The business is not booming as much with the Ukrainian partners, and they would be able to turn around up to 1,000 shirts within a week, delivery included, at the same $65.

The company adopts the outsourcing strategy and only works with the manufacturer in Ukraine. The company places a single order well before the season starts. Due to its long lead time, there is no chance to place a second order if the demand turns out to be high.

The company adopts a more flexible strategy and uses a combination of outsourcing and near-sourcing. The company places its first order before the season starts from the manufacturer in Ukraine and then places a second order from the local manufacturer if demand turns out to be high.

So, we are required to analyze how many shirts should be ordered for the upcoming season.

ANALYSIS and ASSUMPTIONS

Considering the given data, we analyzed what should our dependent variables and independent variables be. We could categorize 2 independent variables, namely, Holiday Season and the number of days in each season where, the holiday season can take 0 and 1 where 0 constitutes a Non-holiday season and 1 otherwise; the Number of day's variable holds a numeric value. With these variables, we have conducted linear regression in order to find the dependent variable which happens to be demand for that season. The obtained equation from the linear regression model is as follows:

Y=B0+B1*X1+B2*X2+Error term.
Where:
B0 = Intercept = -51.7862
B1 = Slope (Holiday season) = 480.147 and X1 = 0 (Non Holiday season)
B2 = Slope (No of days in a season) = 17.241 and X2 = 21 (Non Holiday season)
Standard Error = 115.859
Error term = NORM.INV (Rand (), Mean=0, Standard Error), 0)

Having the equation in hand we started by simulating Scenario 1 and Scenario 2:

For outsourcing only, orders need to be placed upfront before the season starts and cannot accommodate any unprecedented demand. Here we were able to figure out the demand, sales, unsold items, and the refund that can be obtained. Similar details were obtained for Scenario 2 however, insourcing is considered along with outsourcing when the demand turns out to be more than the ordered quantity, however, there is a limit to the number of shirts that can be supplied per day by the insourcing facility which happens to be only 12. Which accounts for 252 for one season which in our case is 21 days.

Another assumption is that the case dictates is the season is a non-holiday season.

Analysis:

We got all the necessary values to perform the required operations by assumptions and regression. Firstly, demand is calculated using the values we got from regression and dependent variables (Number of days in a season, Holiday season). Now using demand and order quantity we calculated Outsourcing, In sourcing, sales, revenue, unsold, refund, Cost price Outsourcing, cost price for insourcing, total cost, and profit. Outsourcing is calculated as the minimum demand and the order quantity. Whereas the Insourcing value is the minimum of what is left after outsourcing but the capacity of the insourcing unit can handle 252 shirts in 21 days. Sales are calculated as the summation of insourcing and outsourcing quantities.

Revenue is calculated as the result of sales and the price per unit which is $135. Unsold products are calculated by comparing demand and order quantity and if the order quantity is greater than the demand, the difference between demand and order quantity is considered. Refund is calculated by multiplying unsold with salvage fee. The cost for outsourcing and insourcing is calculated based on units ordered to the cost associated with it, here for outsourced goods $65 is charged per piece whereas for insourcing it is $95. The total cost for scenario 2 is calculated by adding the Cost price for insourcing and outsourcing. Profit is calculated by getting the difference between revenue and total cost, and after performing 1000 replications, we calculated the average, standard deviation, minimum and maximum profit.

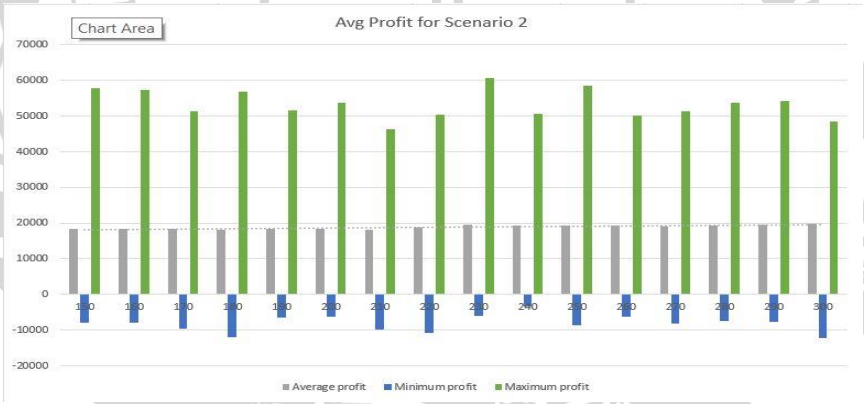
Conclusion

Based on our analysis, we conclude that the profit is determined by the number of holiday seasons and by the number of days in a season for both scenarios.

For scenario 1, The average profit increased in lockstep with the order quantity. When the order quantity is 300, the profit is at its peak.

Here is the graph plotted for the Average, maximum, and minimum for scenario 1.

Based on our analysis for Scenario 2, we conclude that profit is dependent on the order placed from both insourcing and outsourcing. If demand is high, orders must be placed from local vendors, and the maximum order quantity that can be ordered is 252 per season due to capacity constraints.



The maximum profit for the same set of dependent variables as used, we see that for scenario 1 is a little above $20,000, whereas for scenario 2 the maximum attained profit is around $60,000.

We could draw a conclusion that with the flexibility of out-sourcing and in-sourcing the organization happens to gain more profit.