SALES DATA ANALYSIS REPORT

Done by: Johnson Lin

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Project Overview

This project highlights insights from the Tableau visuals and offers recommendations in light of the conclusions. By exploring and analysing the sales data, we want to answer the following key questions:

- Which countries are the most/least profitable? Why?
- Which products are the most/least profitable? Why?
- What is the overall sales and profits trend?
- What are the peak sales periods?
- What are some recommendations to improve profitability?

1. Introduction

This project is conducted using data gathered between January 2018 and December 2021. The primary dataset used comprises of Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, City, State, Country, Postal Code, Market, Region, Product ID, Category, Sub – Category, Product Name, Sales, Quantity, Discount, Profit, Shipping Cost and Order Priority.

The objective of the report is to identify the most and least profitable nations and products, investigate the causes of their unprofitability, identify peak sales periods and propose recommendations to minimize losses and maximize profits.

2. Key Insights

2.1 Top 10 Most and Least Profitable Countries

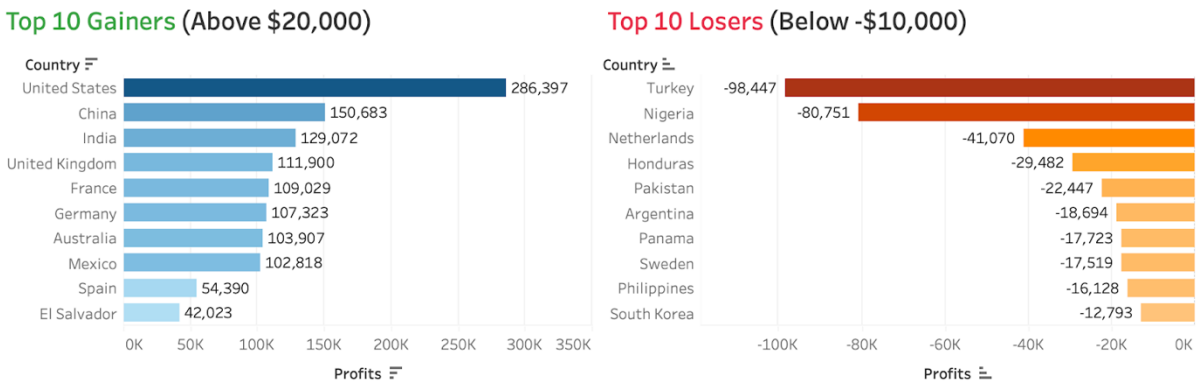

Figure 1: Top 10 Most and Least Profitable Countries

Figure 1 shows the top 10 most profitable and least profitable countries. Most profitable countries include the US, China and France while some of the least profitable countries are Turkey, Nigeria and Netherlands.

We observe that the majority of the top gainers are developed countries, which is reasonable, as such countries have more resources and higher literacy rate which translate to higher profits as compared to developing countries. Amongst the top losers, we observe that there is a mix of both developed and developing countries, such as Turkey and Nigeria respectively.

We conclude that developed countries tend to be more profitable. However, in the Top 10 losers bar chart, we note that developed countries could also be unprofitable. This is shown by countries such as Turkey, which is the most unprofitable despite being a developed country. Next, we explore the possible reasons why some countries are profitable while others are not.

2.2 Relationship between Profits and Discounts

One of the possible factors that impacts profitability may be discount. Hence, we explore the relationship between profits and discounts given.

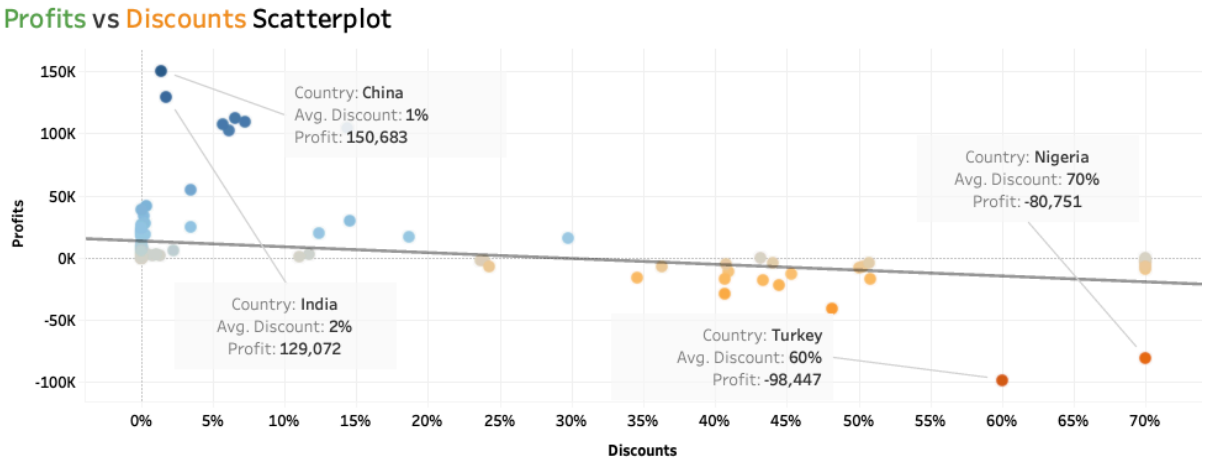

Figure 2: Profits vs Discounts Scatterplot

Figure 2 shows the overall distribution of countries by profits and discounts. We observe that there is a clear negative correlation between profits and discounts where greater discounts means lower profits generated. For example, top profitable countries like China have average discounts of 1% while least profitable countries like Turkey and Nigeria have average discounts of 60% and 70% respectively.

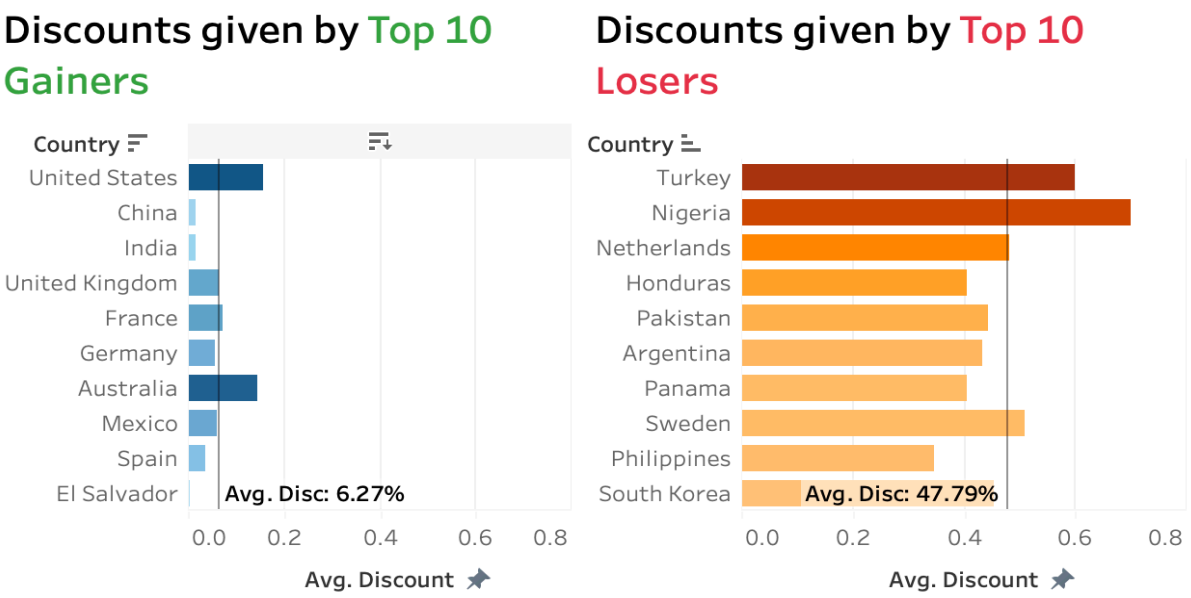

Figure 3: Average discount given by Top 10 Most and Least Profitable Countries

Figure 3 displays the average discount given by most and least profitable countries, which is 6.27% and 47.79% respectively. The drastic difference in discount confirms that profitable countries give lower discounts whereas unprofitable countries give higher discounts.

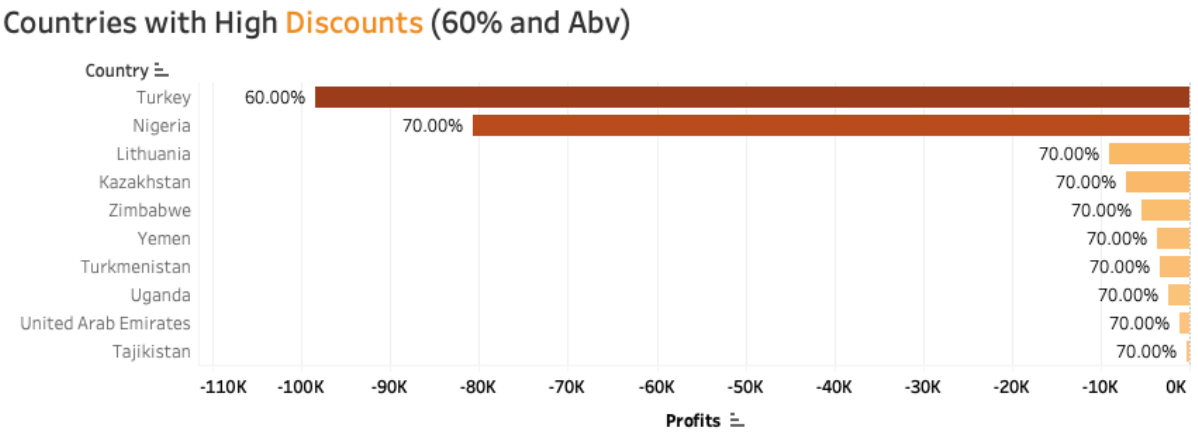

Figure 4: Countries with 60% Discount and above

From Figure 2, we notice that there are some countries with extreme fixed discounts of 60% and 70%, and from Figure 4, it shows that all countries with high discounts are developing countries with the exception of Turkey. In conclusion, developing countries tend to give very high discounts of above 30% (Figure 2), eventuating in losses. The next section will look into the profitability of products.

2.3 Profitability of Different Categories and Sub-Categories

To answer the question as to which products are the most/least profitable, we will first explore the profitability of different categories and subcategories of the products.

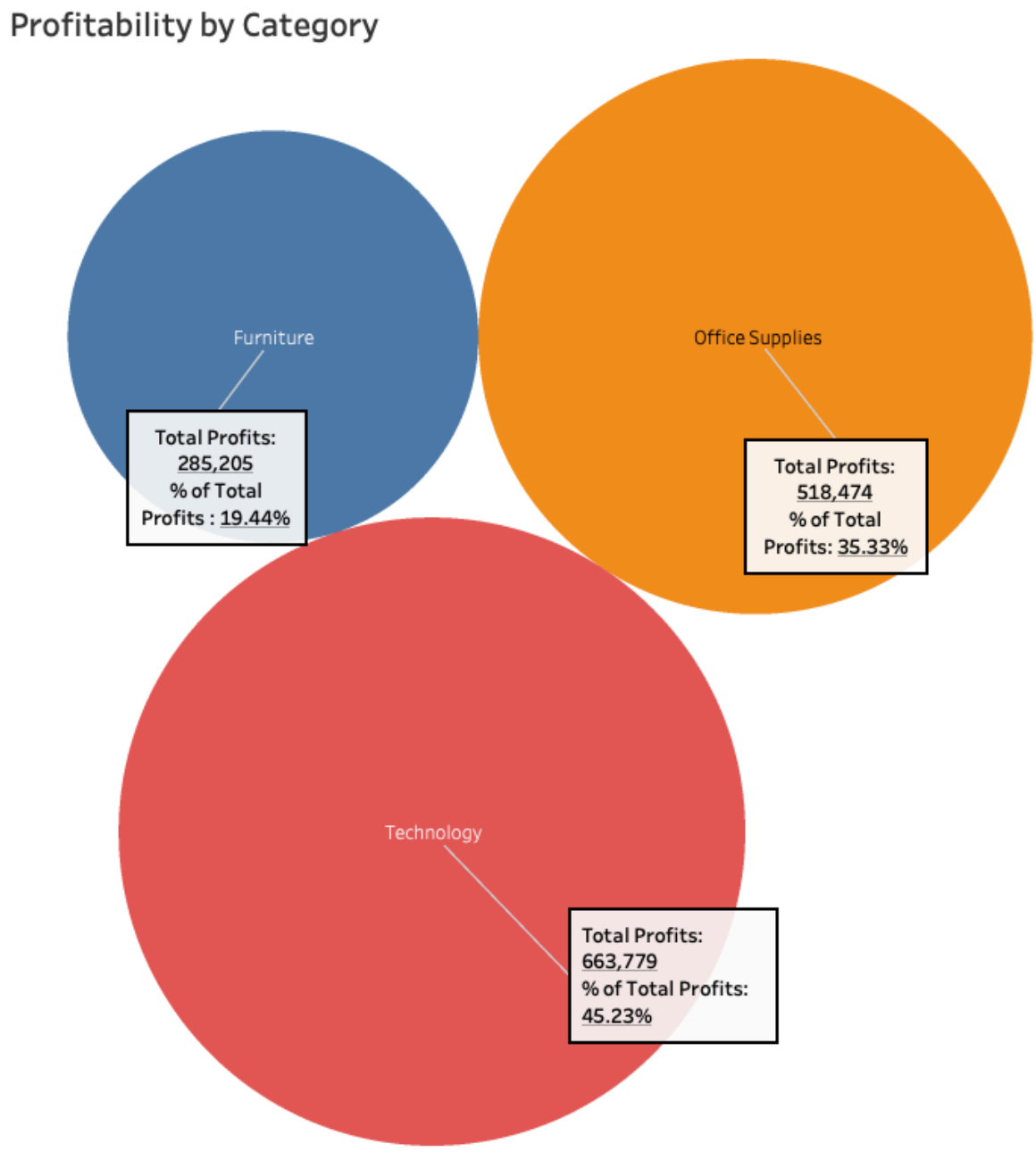

Figure 5: Profitability by category

Based on the visualization above, we observe that technology carries the highest total profits of 660K, followed by office supplies with around 520K profits, and furniture with 285K profits.

Figure 6: Average profits by category and sub-category

From Figure 6, we discover that copiers and phones under technology are the most profitable with profits above $200K each. Products generating moderate profits ranging from $100K and $200K are accessories under technology, appliances and storage under office supplies, and bookcases and chairs under furniture. The rest of the products generated low profits from $0 to $100K, with the exception of tables under furniture, which is the only product that has losses of $64K.

We can conclude that the best performing category is technology due to significant profits from copiers and phones while the worst performing category is furniture on account of losses associated with tables. The next section will investigate the unprofitability of tables by comparing the rankings of all products in terms of sales, discount and shipping cost.

2.4 Ranking of All Products

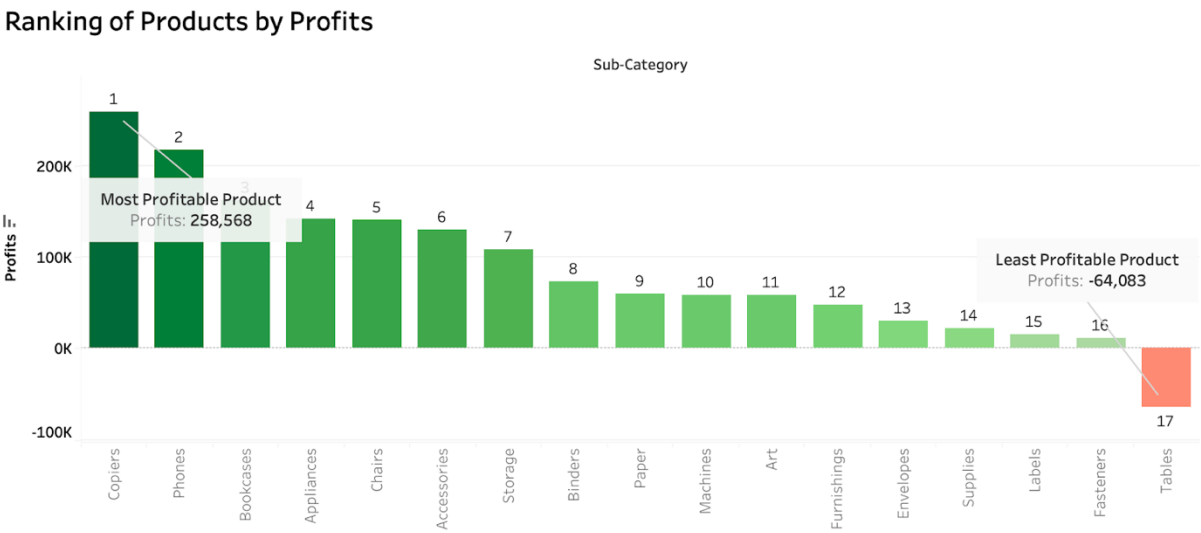

Figure 7: Profitability of All Products

Figure 7 shows that among the 17 products, tables are ranked the lowest. As mentioned before, tables are the only product with negative returns, thus it is imperative to understand the reasons behind the unprofitability of tables.

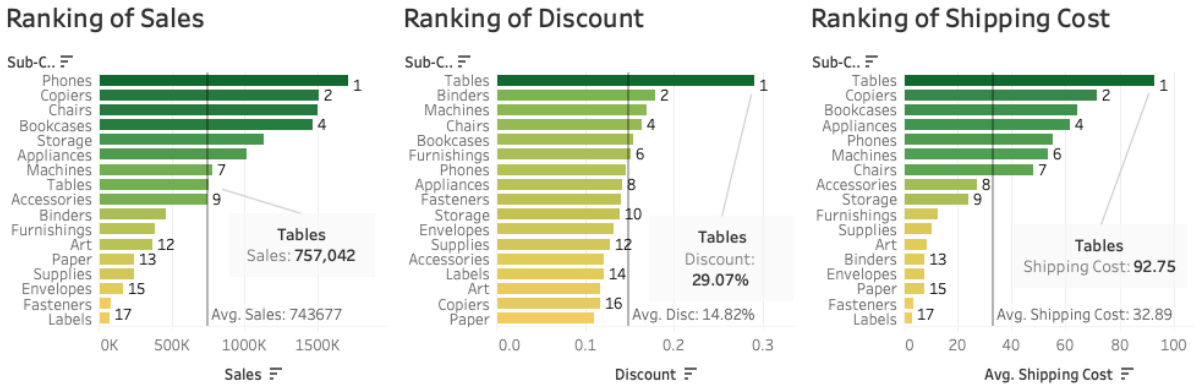

Figure 8: Products ranking of sales, discount and shipping cost

The above figure presents the ranking of all 17 products in terms of their sales, discount and shipping cost to determine the underlying reasons resulting in unprofitability.

First, we notice that tables are ranked 8th out of 17 products in terms of sales. The total sales of tables is very close to the average sales of all products, hence there is no clear difference between sales of tables and average sales of other products. The unprofitability of tables thus does not correspond to the lack of sales.

Tables are ranked 1st in terms of discount. The discount for tables is 29% whereas the average discount is 15%. With a significantly larger percentage of discount, it is no wonder that tables are unprofitable despite having decent sales.

Also, tables are ranked 1st in terms of shipping cost (up to $93). The average shipping cost is significantly lower at $33. Such expensive shipping cost greatly reduces profit margins, therefore, causing sales of tables to be unprofitable.

In summary, high discounts and high shipping cost are the likely reasons behind the unprofitability of tables. The following section will investigate the sales and profits of all products vs tables over time, to identify trends and predict future sales and profits.

2.5 Sales and Profits Over Time

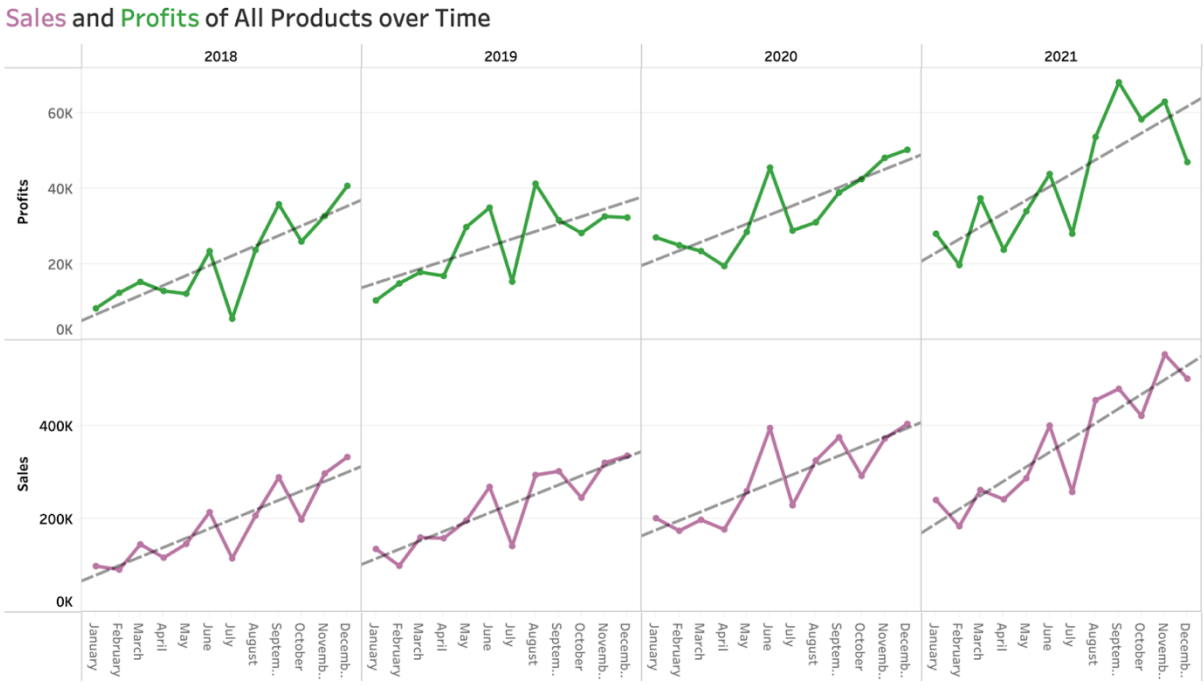

Figure 9: Sales and profits of all products over time

Figure 9 shows the sales and profits of all products, from the start of 2018 to the end of 2021. We observe that both sales and profits are on an upward trend and the trend line generally becomes steeper over the years. This suggests that sales have been increasing steadily over the past years and with higher sales volume, profits rise.

Another observation is the seasonal effect as seen from the spikes in sales during June, September, November and December. This could be due to increased demand of customers during holiday periods, resulting in significant rise in sales volume and profits. In contrast, sales tend to slow down in July and October, where demand of customers is considerably lower due to the low season period.

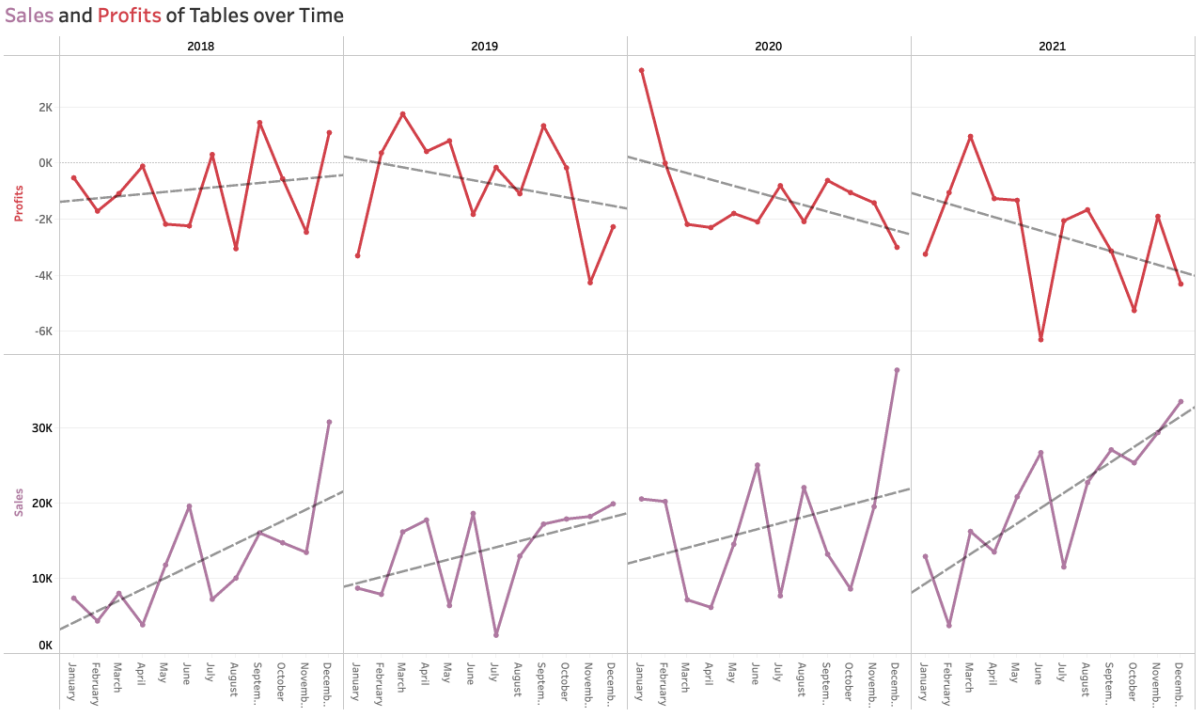

Figure 10: Sales and profits of tables over time

Figure 10 shows the sales and profits of tables. We discover that the sales of tables are trending upwards while the profits of tables are generally trending downwards. In 2018, profits of tables were slightly positively sloped, indicating slow growth in profits. However, at the start of 2019, the profits started trending downwards, with slight increases in steepness over the years. The finding reinforces the fact that sales is not the reason for unprofitability of tables.

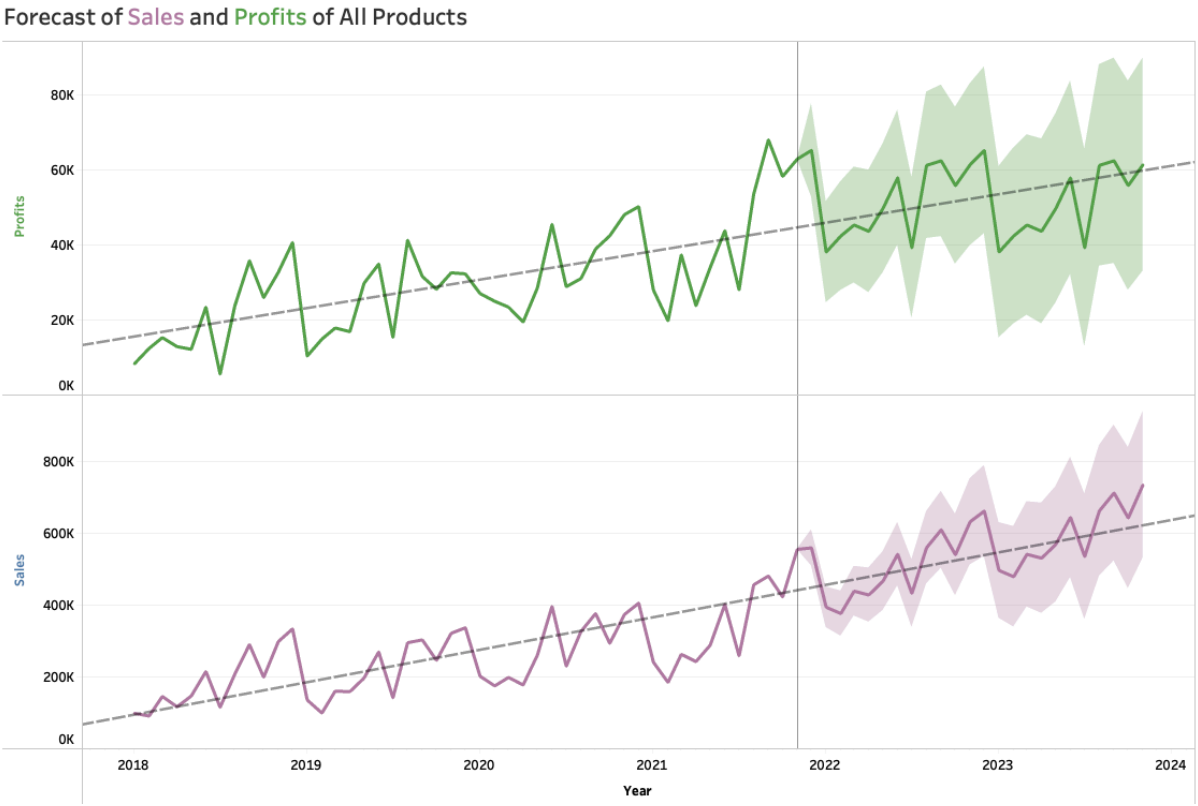

Figure 11: Forecast of sales and profits of all products

The figure above predicts the future sales and profits based on the data from January 2018 to December 2021. It indicates that sales and profits are expected to grow steadily for the next 2 years.

The seasonal effect on sales can be observed as well, as we see low sales at the start of each year, a small spike in the months of June in 2022 and 2023, and significantly higher sales approaching the end of each year.

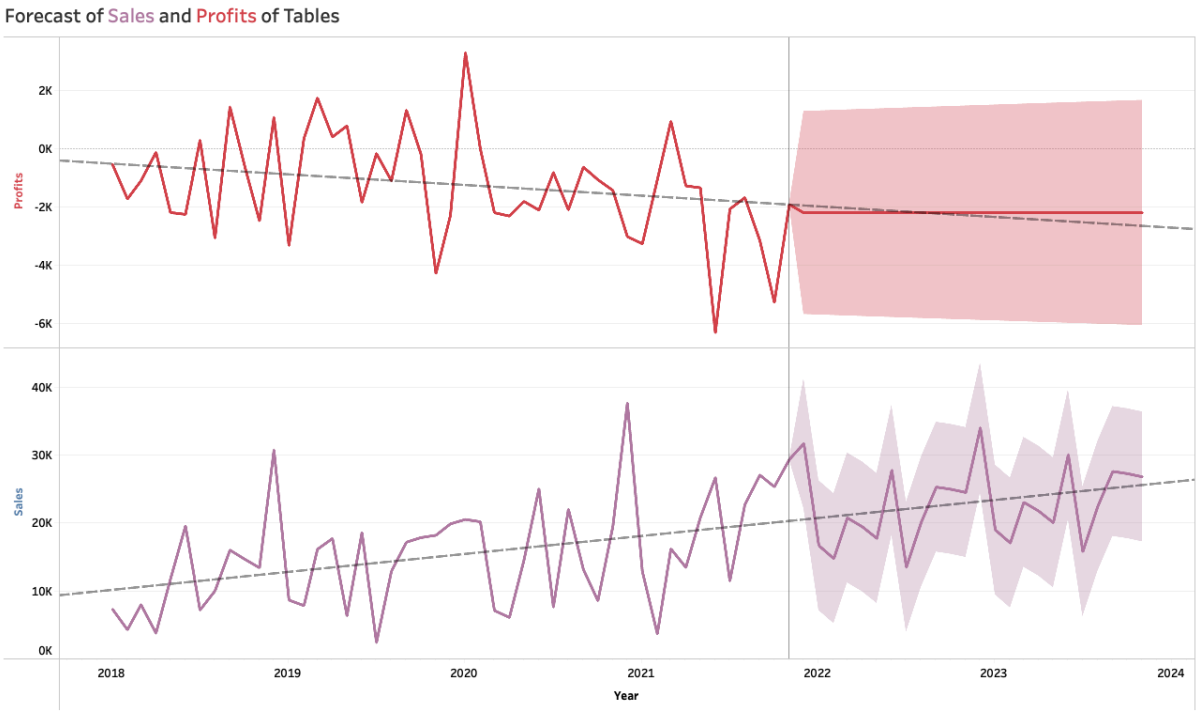

Figure 12: Forecast of sales and profits of tables

From Figure 12, we can observe that sales will continue to increase consistently, while in contrast, profits of tables are forecasted to be negative. However, the forecast of profits may not be realistic as there is no volatility and the data given may be too short to construct a sufficiently accurate prediction.

3. Conclusion

In conclusion, the unprofitability of countries is associated with high discounts while the unprofitability of the tables is resulted from high discounts and high shipping cost. As such, we infer that high discounts have an adverse effect on overall profitability. Next, we will propose recommendations to improve profitability of countries and tables.

4. Recommendations

4.1 Reduction on Discounts

4.1.1 For Countries

It is recommended for unprofitable countries to lower their discount to a reasonable rate so as to not eat into their profits. However, it is imperative to decrease their discount rate progressively instead of adjusting to their desired discount immediately, as a sudden steep change in discount will decrease sales exponentially. A decent desired discount would range from 1% to 10% based on Figure 2.

4.1.2 For Tables

Discounts should be lowered for tables, however reduced discounts will result in a fall in sales of tables. Hence, higher discounts can be given to complementary products such as chairs, which can in turn boost the sales of tables.

4.2 Leverage on Profitable Products

We can leverage on the most profitable products to improve profits. As copiers and phones are the most popular products, adding new similar technological products may be beneficial to improve profits. Removing or reducing stocks of unprofitable products like tables could also improve overall profitability as we minimize storage costs.

4.3 Leverage on Seasonality

Since sales in June, September, November and December are significantly higher as compared to other months due to the seasonal effect, we can cater our products to match the various seasons. Additionally, marketing and promotional activities can be implemented to prepare and attract consumers for the next big seasonal sales.