COMP7507 -Individual Report

Visual Analysis on the Covid-19 Pandemic Recovery of Hong Kong

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1 Indicator selection

First, I would like to tell the reason why I want to choose retail sales as a key indicator of Hong Kong's pandemic recovery, there are several reasons for choosing retail sales as an indicator of economic recovery:

Consumption drives economic growth: Retail sales reflect consumer spending levels. Consumer spending plays an important role in many economies, so monitoring the growth of retail sales can provide insight into whether consumer confidence and spending levels are returning, indicating that the economy is recovering.

The retail industry is a major source of employment: In many countries, the retail industry tends to be one of the largest employers. Therefore, the growth of retail sales can indirectly reflect the conditions of the labor market. When retail sales grow, it is often necessary to hire more employees to meet consumer demand, thereby creating jobs and promoting economic recovery.

The retail industry is also interconnected with various economic sectors: The retail industry is closely related to the supply chain, manufacturing, and service industries. By monitoring the growth of retail sales, we can understand the sales of products in the supply chain and changes in consumer demand, which helps to assess the vitality and recovery of the entire economic system.

However, it should be noted that retail sales are only part of the economic recovery indicator and cannot fully reflect the overall economic conditions. So, my teammates took another analysis on other indicators.

2 Details of tasks

My task is to analyze the changes in retail sales during the pandemic time and draw conclusions based on the analysis.

2.1 Dataset collection and preprocessing

Because we want to analyze Hong Kong's overall retail sales, official data is the most convincing. So, I got the retail sales dataset from the Census and Statistics Department of the Government of the Hong Kong Special Administrative Region.

However, the retail data provided on the official government website are not directly suitable for carrying out visual analysis in Tableau. It is necessary to select a representative dataset and preprocess the dataset to be the Tableau format.

In the original data set on the official website, there are many calculated year-by-year index numbers, which are redundant and unnecessary for visualization, because in Tableau, this can be obtained by quick table calculations. Besides, the raw dataset provided by the government contains many key metrics such as operating expenses, employee compensation, and other metrics that are not closely related to our topic. Therefore, I deleted these columns for improvement.

At the same time, the data I need is scattered in different tables in the original data set, and the format is not uniform. I performed row-column conversion on the online retail data set, the total retail sales dataset, and the retail sales data set divided by category. And divide the categories into two columns, namely main types, and detailed types, to facilitate following visual analysis.
Following are the main dataset tables that I used:

Total retail sales:

- Total value of retail sales (HK$ million)
- Date(Year/Month)

Online retail sales:

- Total value of online retail sales (HK$ million)
- Date(Year/Month)

Retail sales Category:

- Total value of retail sales (HK$ million)
- Main type of retail outlet
- Detailed type of retail outlet
- Date(Year/Month)

2.2 Visualization and Analysis Results

2.2.1 Total Retail Sales

For the total retail sales, I will utilize a bar chart with different colors for each year to observe the overall change from 2019 to 2023. This visualization will provide an overview of the specific values of retail sales for each year. However, solely observing the absolute values may not provide sufficient information. To address this, I will use a

line chart to display the percentage difference from 2019 for each subsequent year, represented by the same color for consistency. This approach allows us to compare the changes in retail sales values over the four-year period, specifically examining the impact of the epidemic. And it be shown in following Figure1 left side.

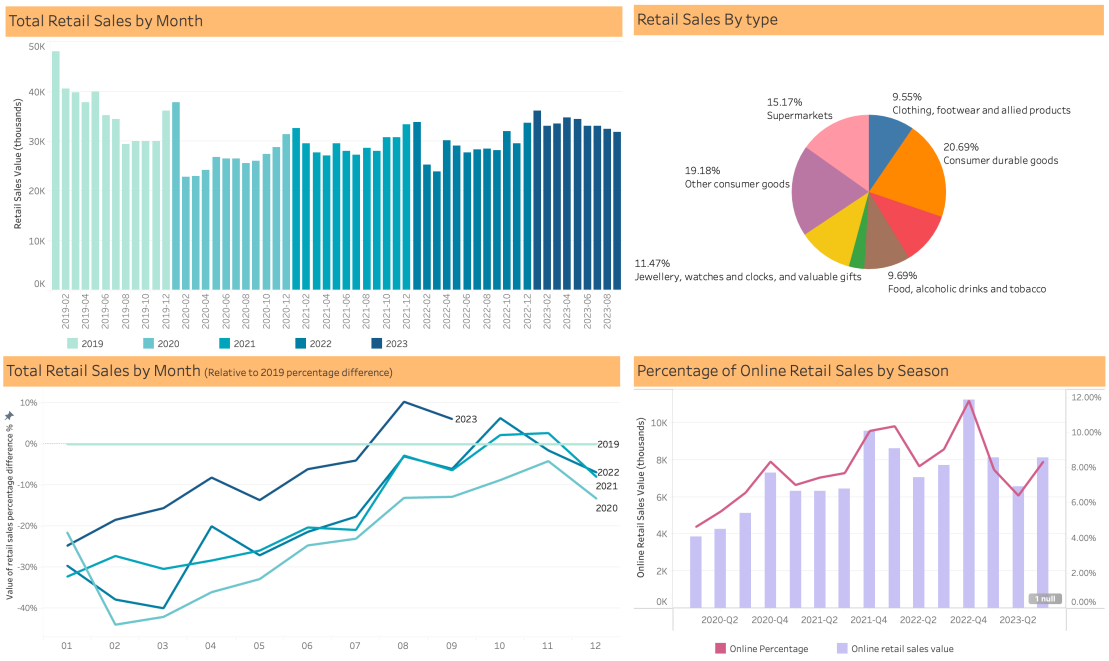

Figure 1. Dashboard of Total Retail Sales

Based on the visualization in Figure 1, we can observe the following trends:

Overall Retail Sales: There was a downward trend in retail sales from 2019 to 2021, indicating the impact of the COVID-19 pandemic. However, there is a small rebound in retail sales in 2023. This suggests a gradual recovery in the retail sector.

Percentage Difference Relative to 2019: In 2020, which was the worst year of the COVID-19 outbreak, the total retail sales for each month were lower than in 2019. However, in 2023, starting from August, the total sales have exceeded the levels of 2019. Based on a review of the last two years (2021 and 2022), we can predict that the sales scenario for October and November of this year will also be better than in 2019.

Retail Sales by Type: Examining retail sales by type, we can see that the overall proportion of various categories has not changed significantly over the last four years. Additionally, it is evident that the "other consumer goods" category has consistently had the highest sales among the different categories.

2.2.2 Online retail sales

With regards to online retail sales, the combination of line and bar charts allows us to effectively visualize the specific values of online sales data and the year-to-year changes.

From Figure 1 the last chart, we can observe a small peak in online sales during the fourth quarter of 2022. This increase in online sales could be attributed to the easing of pandemic restrictions and the growth of online shopping live-streaming. These factors likely contributed to a surge in consumer interest and engagement with online retail platforms during that period.

By examining the online sales data and identifying the peak in the fourth quarter of 2022, we can gain insights into the impact of external factors, such as the pandemic situation and evolving consumer behavior, on the online retail industry.

2.2.3 Retail sales Category

To obtain a more detailed view of the changes in sales within segmented categories of the total retail sector, it is crucial to utilize visualizations that effectively represent the proportions and sub-categories. Treemaps not only show proportions but also reflect the sub-category proportions within main classifications. Additionally, including tables and packed bubbles in the dashboard can provide further details on the specific types within the retail sector. The table can present specific sales data in a structured format, while packed bubbles can offer an interactive and visually appealing representation of the types, their sizes, and potential relationships.

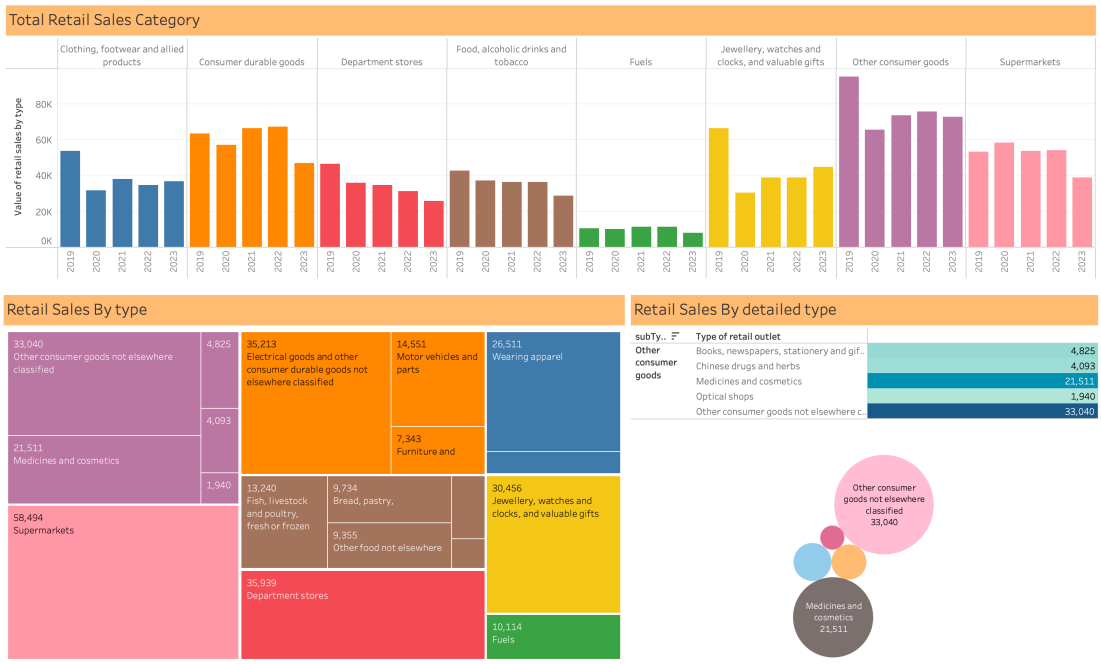

Figure 2. Dashboard of Total Retail Sales By Detailed Type

From the dashboard in Figure 2, we can derive several insights:

The bar chart shows that sales of fuels have remained relatively constant over time. This can be attributed to fuels being a necessity of life, with consistent demand

regardless of the epidemic. However, for non-essential items like jewelry, watches, and clocks, there was a significant decline in sales during the worst phase of the epidemic. This indicates a decrease in consumer enthusiasm for purchasing luxury items during challenging times.

Also I want to analyze the change in sales of department stores and supermarkets:

Department Stores: The data indicates a noticeable downward trend in department store sales year-on-year. This decline may be attributed to multiple factors. Firstly, the impact of the epidemic has affected the overall retail sector, including department stores. Secondly, the increasing popularity of online live-streaming sales has captured a significant share of the market, diverting customers away from physical department stores. This shift towards online shopping platforms has likely contributed to the decline in department store sales.

Supermarkets: In contrast to department stores, supermarkets have demonstrated a relatively stable performance. This stability can be attributed to several factors. Firstly, supermarkets primarily cater to the needs of the elderly population, who are less likely to be influenced by online live sales and more inclined to shop in physical stores. Secondly, supermarkets typically offer essential goods, such as groceries and daily necessities, which are consistently in demand regardless of external circumstances. These factors contribute to the stability of supermarket sales, even in the face of the pandemic.

2.3 Conclusion

By analyzing these insights, we gain a better understanding of the dynamics within the retail sector.

The retail sector experienced a decline in sales during the COVID-19 pandemic but showed signs of recovery in 2023. Online retail sales saw a peak in late 2022, likely influenced by the easing of restrictions and the rise of live streaming. We observe the stability of sales in essential categories and the impact of the epidemic on non-essential items. Furthermore, we recognize the significance of other consumer goods, driven by the increased demand for healthcare-related products during the pandemic. Department stores faced a downward trend, partly due to the popularity of online sales, while supermarkets remained stable due to their focus on essential goods and an elderly customer base.

In summary, the retail sales data suggests that Hong Kong has begun to recover from the impact of COVID-19. However, it has not yet reached pre-pandemic levels, indicating that the retail sector is still in the process of recovering to its baseline performance.