COMP7507 Visualization and Visual Analytics

Individual Report

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

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Assigned Task

My task is to build visualization project for attributes related to office, together with data collection, processing and analysis.

Data

Office buildings are the most common location for work and thus can reflect the health of economy. There are various data related to office, among which I think the most significant are as follows:

- Vacancy rate
- Rent (/m^2 per month)
- Price (/m^2)

Office vacancy rate is an intuitive indicator to reflect the demand for office space in a particular area which is defined by the proportion of office vacancy (the area of non-used office) and stock (the total area of office). Another related feature is the take-up which is given by adding the completions to the vacancy figures at the beginning of the year, then subtracting the year's demolition and the year-end vacancy figures. The data can be found at the official website of Hong Kong government.

The raw data of rent and price used the regions' name as the column name of price and rent in 7 areas, which makes it hard to create relations between different data tables (for example, in the table of rent, column *Sheung Wan* represents the rent in Sheung Wan, while in the table of price, the same column name represents the price). In that case, I reshape the data table, adding new columns named price, rent and region, and use region as the connection between rent and price.

The data above are divided into 3 groups – A, B and C – representing the grades of the office buildings defined by the government. Grade A is the most advanced which means it is more expensive, while grade C is the least.

Visualization Design

The best way to show the changing trends of a figure is line chart, so I built three line charts for vacancy, rent and price respectively at first. Figure 1 shows the initial visualization of rent for example.

However, there were missing data that make the fluctuation of line charts have little meaning, while what I care is actually the tendency. I then rebuild the line chart of rent into scatter plot and draw three trend lines to show the changing tendency (Figure 2).

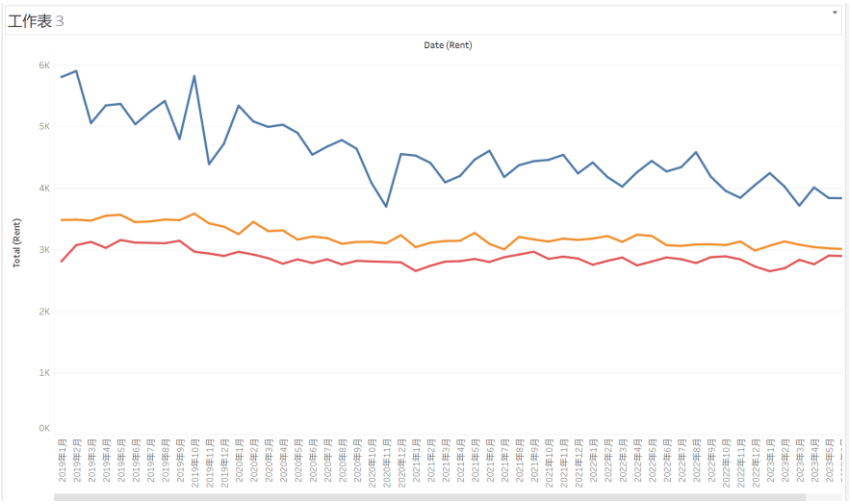

Figure 1. The Initial Rent-Date Chart

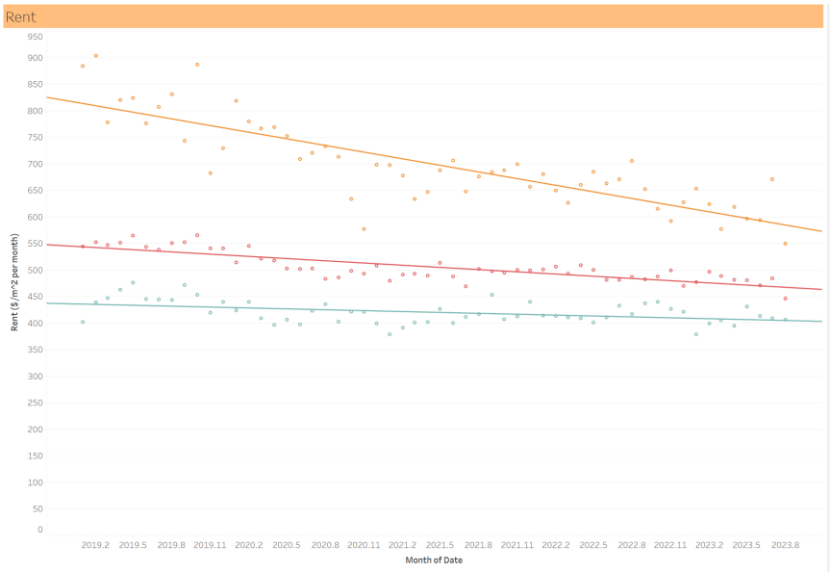

Figure 2. The Final Rent-Date Chart

For the office price, missing data also result in great fluctuation. I have to sum up the data, looking from a whole perspective to reduce the fluctuation. But I want to preserve the grade attributes, so I choose stacked bar chart to show the contributions of different grades.

It is possible to show the data on the map in Tableau. However, I failed to find Hong Kong space file with areas small enough to show our 7 regions. Finally, I have to obtain latitude and longitude information from Google Map and add it manually. So, in fact, the coordinates of the circles are not precise. This circumstance is even more severe when it comes to combined regions such as Wan Chai / Causeway Bay and North Point / Quarry Bay. I finally pickup a point close to the boarder line of the two regions.

Figure 3 shows the final design. The map on the left shows the month average price and rent of 7 regions respectively in a particular year, where the scale of the circle represents

for the rent and shade represents for the price. I find placing the Year column directly in the Page box rather than creating a filter is a better way to realize the interaction of changing the year. In addition, to observe the change of a certain region, I create filters on regions and apply it to all sheets. Now anyone can show it by simply clicking the targeted region circle.

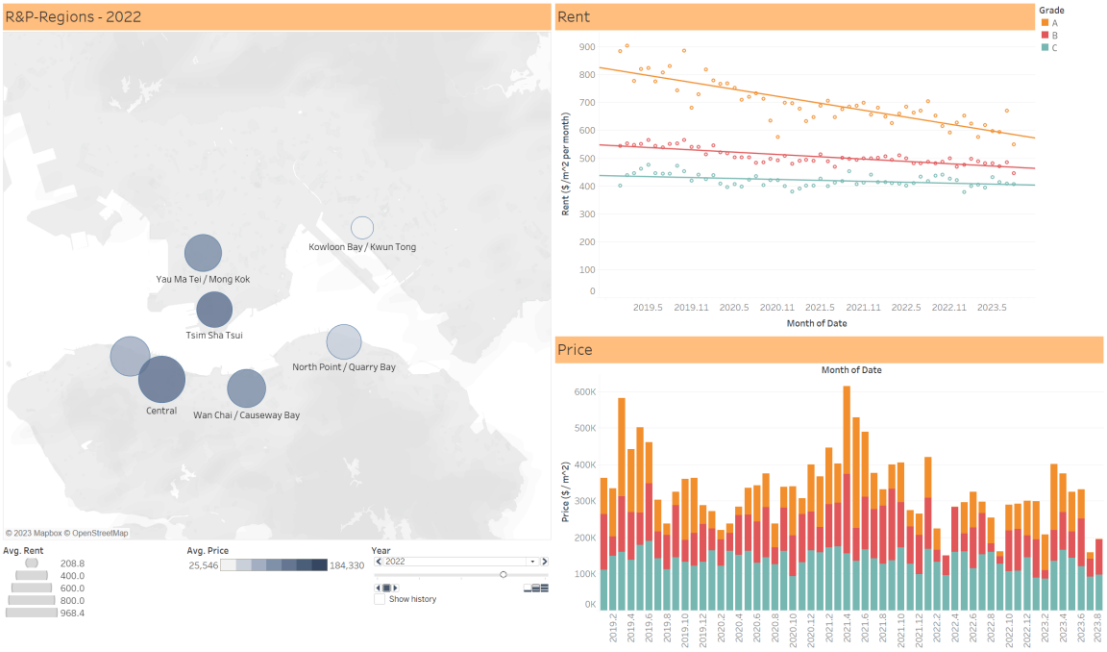

Figure 3. Dashboard of rent and price

The office vacancy rate can be easily showed by line chart (Figure 4), and do not have interactions with the other three charts because the timespans of them are different, let alone the former do not have the attribute *region*. I left it on the dashboard in Figure 3 at first.

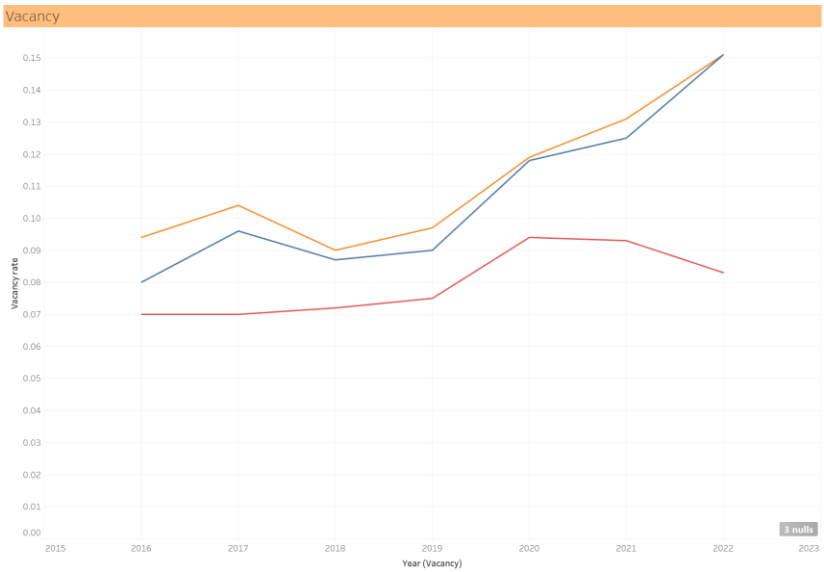

Figure 4. Vacancy rate-Year Chart

The take-up figure was not considered in this stage.

Analysis

In Figure 2, the decreasing of rent during the pandemic period can be intuitively seen by the trend lines in the Rent-Date chart, especially for grade A, and the similar situation happens to all of the 7 regions (can be checked by clicking the circles). It seems that the impact of Covid-19 remains, indicating the economic downturn is still causing the drop of rent.

By contrast, the Price-Date chart does not show obvious relationship between price and the pandemic. One possible explanation is that the transaction of an office mainly relies on the market. That is, if the demand drops, the sellers are likely to not selling the office rather than lower the price, which agrees with the intuition.

I also failed to explore the difference among regions. The rent seems to drop in all the 7 regions and there is nothing special to me. But I preserve the feature in case anyone can figure the relationship out.

The change of vacancy rate of grade A and B also agrees with the intuition (see Figure 4), but what seems abnormal is grade C. During the pandemic, the vacancy rate of A and B both increases, while the counterpart of C drops. In theory, the vacancy rate of all 3 grades should have increased, because the number of people who can go to work or get a job should have decreased. After analyzing, I get another way to observe this issue: people's demand for an office space cannot be easily removed, since grade A and B has higher price and rent, people may tend to choose cheaper grade C. This is another proof of the relatively unhealthy economy.

In conclusion, from the aspect of office, the impact of the pandemic still exists. All of the indicators in this part do not show recovery or do not recover to their initial conditions.