

Data science project

1. Do passengers spend more money at LAX airport when their flights are delayed?
2. Is passenger destination or flight distance correlated with the amount spent per person?

Data

- Flights during 2015 and 2016 from LAX to North American destinations. The data was sourced from <https://www.transtats.bts.gov>
- Amount of money spent per person on concessions at LAX during 2015 and 2016.
The data was sourced from <http://www.lawa.org/LAXConcessions.aspx>
Note that the December data was not available.

Exploration

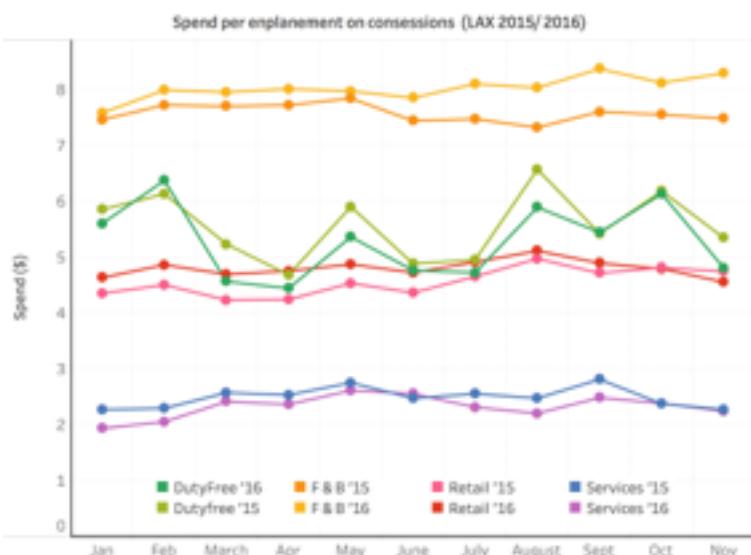


Figure 1

Figure 1 shows the average monthly spending per person on duty-free, food and beverage (F&B), retail and services for the years 2015 and 2016 at LAX airport.

The duty-free spending fluctuates monthly and the trend is mirrored both years.

The other monthly spending categories are relatively stable throughout the year.

The average duty-free spend spikes in October, February, August and May.



Figure 2

To search for possible correlations, Figure 2 shows the average delay time by carrier per month for 2016. The peak duty-free spend months do not match the months that have longer delays.

To check whether average duty-free spending increases with flight distance, Figure 3 and 4 show the average duty-free spending per month plotted against the average flight distance for the years 2015 and 2016.

Again these two plots do not offer any insights into the fluctuations in duty-free spending.

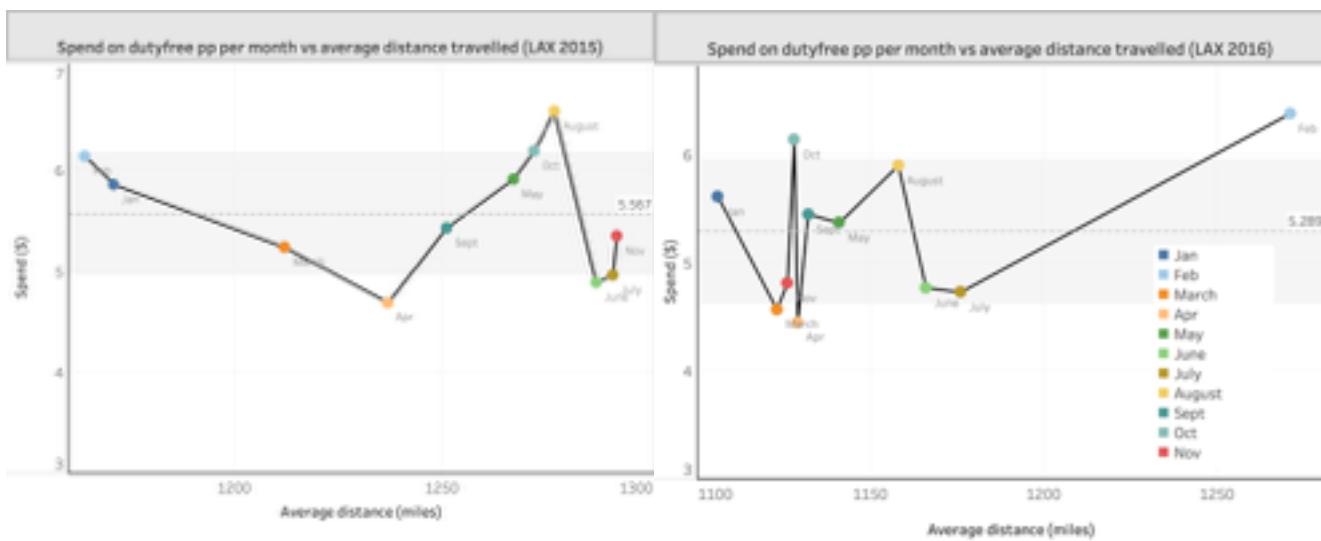


Figure 3 & 4

Figure 5 shows the volume of air traffic departing LAX each month. The colours represent the number of flights to that state. There are no anomalies from month to month but we can see that the most number of flights visit the states of California, Texas and Nevada. Only data from these three states is considered in the proceeding analysis.



Figure 5

Figure 6 shows the change in the monthly flight volume from LAX to California, Texas and Nevada in 2016. The data has been normalised to the January value.

Interestingly, the months with higher duty-free spending and overall spending (Figure 1) are associated with reduced flight numbers.



Figure 6

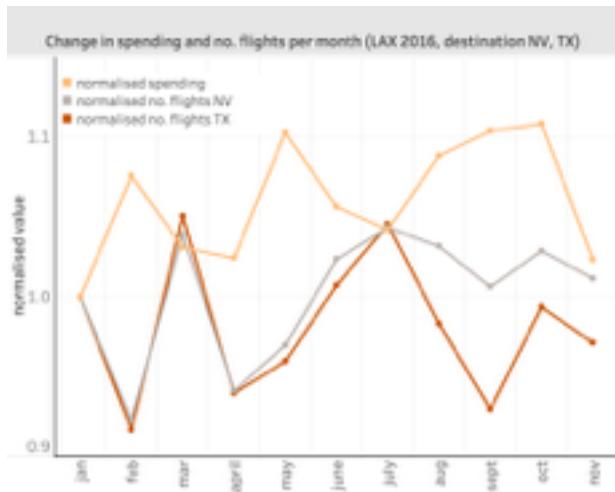


Figure 7

To compare the two metrics, the duty-free spending is normalised to the January value and plotted alongside the change in flight volume per month for Texas and Nevada in Figure 7.

In many instances when the spending increases, the flight volume for these two states decreases.

The heat map (Figure 8) shows the correlation between the flight data sets and the spending data sets. The blue hue indicates an anti-correlation between spending and flight volume.

For flights to California from LAX, although the correlation is modest, the spending on services is correlated with the flight volume.

For flights to Texas from LAX, there is a modest anti-correlation between duty-free spending to the volume of flights.

For flights to Nevada from LAX, the predominantly green hue indicates that the volume of flights is not correlated with any of the spending metrics.

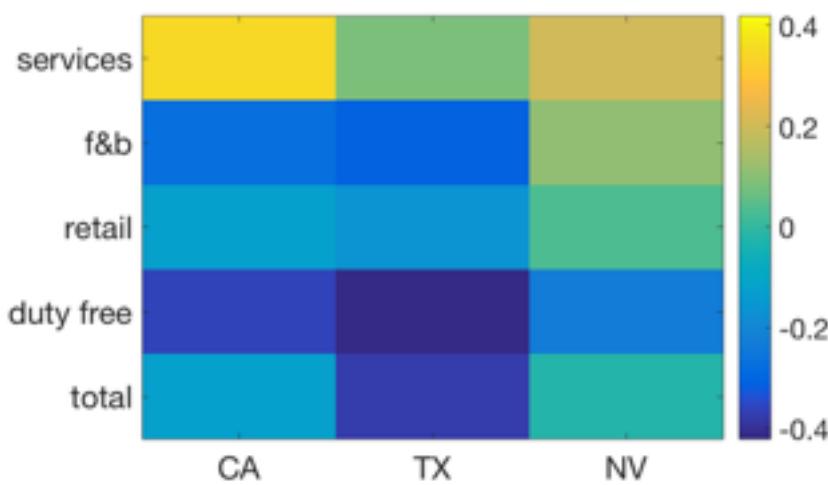


Figure 8

Insights

- From flights leaving LAX, the average flight distance and the average delay time do not influence customer airport spending.
- Increased number of flights to the most popular destinations are anti-correlated with the amount of spending (aside from services). Notably, the size of the plane and number of occupied seats is not taken into account by this analysis. The results may be an indication that flights to these destinations are under-booked and have free seats available.
- A reduction in passenger spending when passengers are visiting the more popular destinations may be due to an increase in the frequency of use of airport facilities. That is, commuters are less likely to spend money on duty-free relative to someone who frequents the airport less often.

This information could be used to make more informed decisions regarding the likely impact of future changes in air-traffic volume on consumer airport spending.