**Quick Service Restaurant (QSR) Sales Performance Analysis**

# Motivation

The deal team has informed us that they are considering bidding on a restaurant chain company. In addition to looking into overall company financials such as revenue, margins, EBITDA, and free cash flows from investment bankers, we have been asked to run an additional outside-in diligence analysis with transaction-level data across 9 restaurant companies.

This report summarizes the data analysis as well as derived insights. It provides an overview of the performance of the 9 restaurant chains and quantifies their financial health. Finally, an investment recommendation is given and justified.

# Data

The data looks at transaction information from 9 different restaurant chains: Chipotle, PaneraBread, Dunkin Donuts, Wingstop, Subway, Taco Bell, Jimmy John’s, Sweetgreen, Shake Shack and Burger King. The dataset spans transactions that occurred between 2019 and 2022.

Each of the four tables serves a different purpose:

* Qsr\_case\_study\_transactions\_20230504 looks at order information. For example, it includes information about the order price, discount, item bought and quantity.
* Qsr\_case\_study\_merchants\_20230504 looks at restaurant chain information. This provides more information into what each merchant sells.
* Qsr\_case\_study\_users\_20230504 looks at customer information. This provides information on users who have placed an order and includes data such as the state they live in, their gender, their income bracket, etc.
* Qsr\_case\_study\_descriptions\_20230504 provides descriptions of the items being bought and sold.

Figure 1 below shows the distribution of users in each state and gives us a better idea of where the majority of customers come from. We can see that most customers come from Texas or California.

A graph of different colored bars

Description automatically generated

Figure 1

A graph of a number of people

Description automatically generatedI was also interested in understanding gender disparities in our dataset. Figure 2 below shows the distributions of male and female customers for each income bracket. No obvious disparity is shown here and it looks like the overall majority of female customers in our data is well represented across income brackets.

Figure 2

Finally, this dataset also allows us to get some insights into the ethnicities of people who tend to go these 9 restaurant chains. Figure 3 below shows skewness and a large majority of Non Hispanic White individuals.

A bar graph with different colored squares

Description automatically generated

Figure 3

# Analysis

**Overall Metrics: 2019-2022**

Formulas for average order value, median order value and number of orders are self explanatory. For Revenue Market Share, I simply divided each company’s revenue by the total industry revenues. Similarly for Order Volume Market Share, I divided each company’s order volume by the total industry order volume.

We first look at data summarized over the entire timeline, Figure 4 shows overall average order value for each chain. Wingstop dominates while Burger King seems to be on the cheaper end.

A bar graph with blue bars

Description automatically generatedFor median order value, Figure 5 illustrates a similar distribution to Figure 4.

Figure 4

A bar graph with blue bars

Description automatically generated

Figure 5

Revenue market share averaged across all quarters is shown in Figure 6. We can see how Chipotle has been dominating the market in terms of revenue from 2019 to 2022. They make up for almost a third of the total market. They are followed by PaneraBread and Dunkin Donuts. We note how Dunkin Donuts make up for almost 17% of the market even though their average and median order value are considered within the industry bottom. This makes sense since Dunkin Donuts makes a lot of its profits from small orders like coffee or snacks.

A pie chart with different colored circles

Description automatically generated

Figure 6

A pie chart of order volume market share

Description automatically generatedFigure 7 confirms the Chipotle dominance with the Mexican Food chain counting for almost 28% of the order volume market. They are followed by Dunkin Donuts, which confirms our previous claim that Dunkin counts on large volume and low prices.

Figure 7

Finally, the bar plot in Figure 8 shows that not only Chipotle has more orders and larger revenues than its counterparts, but it also has a larger customer base.

A bar graph with blue bars

Description automatically generated

Figure 8

On the other side of the scale, we can see that Shake Shack, Sweetgreen and Burger King struggle to match their competitors in terms of revenue, order volume and number of customers.

**Overall Metrics: Quarterly**

We then look at how the same metrics behave on a quarterly basis so we can get more insights into how they evolve with time. We will only look at average order value and disregard median order value since they both give similar intuitions on the ‘central’ metrics of our data. Figure 9 depicts the evolution of the average order value for the 9 restaurants on a quarterly basis. As expected, we observe similar orderings as in Figure 4. It is interesting to see however that some chains like Jimmy John’s, Shake Shack and Chipotle have seen increasing order value. This can be due to either higher prices or people buying larger amounts of food through better company marketing, or discount strategies that would encourage customers to consume more.

A graph of different colored lines

Description automatically generated

Figure 9

Figure 10 shows the evolution of the market share across chains. It looks like Chipotle’s market share peaked in mid-year 2020 and has come down to a more stable level since then. The other chains maintain somewhat of a stable market share across the three years.

A graph of different colored lines

Description automatically generated

Figure 10

Similar behavior can be observed if we were to plot the evolution of order volume market share (see notebook). Again, Chipotle, Dunkin Donut and PaneraBread dominate their counterparts.

Figure 11 shows the evolution of the number of orders for each chain. While Chipotle’s number of orders has slightly come down in 2022, it still has an overall increase from 2019 to 2022. PaneraBread and Dunkin Donuts have gone through an increase in number of orders since mid-year 2022.

A graph of different colored lines

Description automatically generated

Figure 11

A graph of different colored lines

Description automatically generatedFinally, Figure 12 shows the evolution of the number of customers for each restaurant. We can see that the recent slight drop in revenue market share for Chipotle may be attributed by its decreasing number of customers over the last months. PaneraBread’s good financial health in the recent years can also be partly attributed to its growing customer base. Interestingly, we see that Dunkin Donuts’ has barely increased its number of customers and is still able to have a slight increase (or stability) in the number of orders and the revenue market share. This indicates loyal customers and is a sign of good customer retention as we will see later in this report.

Figure 12

**State Revenue Market Share**

We can increase even more the level of granularity of our analysis by looking at states individually and separately. Both the overall and quarterly analyses are included in the notebook. For quarterly results, please refer to the excel output.

Here, I decided to focus on overall state results because they are easier to visualize and analyze.

If we are to look at total revenue per state, we find the following results (output from code):

A close up of a text

Description automatically generatedFigure 1 had shown that Texas, Florida, California and New York were among the states with the most transactions and hence the states bringing the most revenue. From the above, we can see that Chipotle is the leader in total revenues for three of them, while Dunkin Donuts is number one in NY. This further confirms our initial thoughts that these two are among the financially healthier chains.

Looking at market share breakdown per state, we actually obtain the same result as above where Chipotle and Dunkin seem to be leading the most ‘active’ states.

**Household Income Revenue Market Share:**

Instead of breaking down the data by state, we can also look at which restaurant chains perform best according to household income brackets. This allows us to better understand which socio-economic groups of individuals are chains most successful in. Again, both the overall and quarterly analyses are included in the notebook. For quarterly results, please refer to the excel output.

Here, I decided to focus on overall state results because they are easier to visualize and analyze.

A black text on a white background

Description automatically generatedIf we are to look at total revenue and revenue market share per income bracket, we find the following results (output from code):

The results are completely in favor of Chipotle, which dominates its counterparts in all income brackets. This confirms the financial health of Chipotle, which has found a way to appeal to individuals from very different socio-economic backgrounds.

A graph of a number of bars

Description automatically generatedIn the notebook, you will find distributions of customers per income group for each of the chain. Since Chipotle dominates this category, I have decided to only plot the distribution for the Mexican chain here in Figure 13 below:

Figure 13

Most customers seem to be coming from the ‘middle’ classes with household incomes between $50k and $150k. They have still been able to attract customers from both ends of the scale with close to 40000 customers from $1-15k income households and 100000 customers from $250k+ income households.

**New Cohort Retention**

We then looked at how chains were able to retain their customers. This is crucial when evaluating the financial health of restaurant chains since it is a good measure of how well they might be able to maintain or increase their current customer base in the future. As we saw in Figures 10 and 12, larger customer bases often mean larger revenue market shares and hence more revenues. Furthermore, higher retention rates and good indications of good customer service, high quality products and overall satisfactory user experience.

To find customer retention, we first broke down the data into ‘acquisition’ cohorts wherein people that ‘joined’ (i.e. first consumed) at a particular restaurant chain the same quarter are grouped together. We then looked at how many of these customers repurchased in the following quarters.

Cohort retention matrices for each chain are available both in the notebook and in the excel. For clarity, I have not included them here. Instead, I will look at retention rate for all chains averaged across all ‘joining’ cohorts (i.e. we look at the percentage of retention after a given number of quarters regardless of when customers joined the corresponding restaurant chain). The resulting plot is shown in Figure 14. As alluded to earlier, Dunkin Donuts is the best at maintaining its customer base at high percentages over the quarters. Chipotle comes in second but still does well at maintaining a fixed retention rate even though it is lower than Dunkin Donuts’.

A graph of different colored lines

Description automatically generated

Figure 14

**Customer Overlap**

We then looked at the number of ‘exclusive’ customers in each restaurant brand. This is also a good measure of how satisfied users are with a particular chain and hence how loyal they are likely to stay to that restaurant. They are even more important when looking at investing in a single chain because they give a good estimate of the expected number of customers to be keeping from competitors.

Restaurant chains able to maintain or increase their number of exclusive customers are often in better financial health. Figure 15 below breaks down the number of exclusive customers per year per restaurant chain. Note that data for Burger King and Wingstop were only available at later times in 2019 and 2020 and corresponding early exclusive customer counts should therefore be disregarded for this analysis. Among chains that have the highest number of exclusive customers, we can see that PaneraBread is able to maintain close to a constant number, which indicates satisfactory user experience. Chipotle has been able to maintain its status as chain with the highest number of exclusive customers but that number has somewhat declined over the past couple of years. Finally, Dunkin Donuts shows stable growth in its number of exclusive customers. That number remains low and could be explained by the fact that Dunkin Donuts offers mostly snacks and beverages, which would not necessarily keep customers from buying more substantial food at other chains.

**A table of numbers and a list of food items

Description automatically generated**

Figure 15

The heatmap shown in Figure 16 indicates the percentage of a chain’s customers that also consume at other chains. Chipotle is the one chain that is able to keep low values across its row while also being represented by high percentages in other chains’ rows. This indicates that it possesses one of the strongest brand values and customer loyalty.

A chart with numbers and symbols

Description automatically generated

Figure 16

**Final Recommendation**

The first part of this analysis on overall averaged metrics has shown that Chipotle dominates its counterparts in all of revenue market share, order volume market share and total number of customers.

We then showed that Chipotle was repeatedly among the top restaurant chains in revenue market shares within those states that brought most overall revenue. This indicates that the restaurant chain has been able to successfully implement physical restaurants in those states with largest revenue potential. It shows good decision-making and successful implementation.

We have also showed that Chipotle is the leading restaurant chain by revenue market share in all of the household income brackets. Again, this shows good decision-making by Chipotle’s leadership in making sure they are able to appeal to various socio-economic groups of people and making substantial revenues within the latter.

We also demonstrated the quality of user experience at Chipotle, which has maintained the second highest retention rate among its competitors, only beaten by Dunkin Donuts. This shows great ability at finding ways to keeping new customers excited and interested in their products.

Finally, through our Customer Overlap analysis, we have shown that Chipotle possesses the

strongest brand values and customer loyalty. It is able to maintain the highest number of exclusive customers, while keeping percentages of its customers that also consume at other chains low.

**For the reasons mentioned above, Chipotle is my investment recommendation.**

Note that quarterly metric analysis has indicated that, even though Chipotle remains at the top, they have experienced a slight decline in their revenue market share, number of orders and number of customers over the past few quarters. While the decrease rate is not alarming and the Mexican restaurant chain still dominates its counterparts, it would be something to investigate and to correct if the investment was to go through.