

Chewy KPI Analysis Report

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Introduction

The goal of this analysis is to study the key performance indicators of Chewy, an E-commerce company. The email receipt data from 2018 to 2019 will be analyzed and used to build data visualizations on metrics such as quarterly total orders, total number of items purchased and profit margins etc. By analyzing and visualizing these important figures, one can get an insight about how the company is performing and providing services for their customers.

Data Exploration

The email receipt data from 2018 to 2019 contains 12 features and 598577 rows, with the majority transactions coming from Chewy. The Chewy transaction data was wrangled and grouped by the order id since an order can contain multiple items, then grouped by order date in order to aggregate daily key metrics such as total items purchased, items prices, tax, shipping cost, discount, order total and profit for each day from 2018 to 2019.

Data Analysis

The heat map (figure 1) shows the correlations among the features in the data set. We can see that tax, shipping cost and discount are all positively correlated with item quantity. It makes sense because as more items were purchased, tax, shipping cost and discount tend to increase as well. The profit, namely the amount deducting the total items price, tax, shipping cost and discount from order total, has a slightly negative correlation (-0.31) with order total. It seems to suggest that as the order total increases, the profit margin tends to decrease.

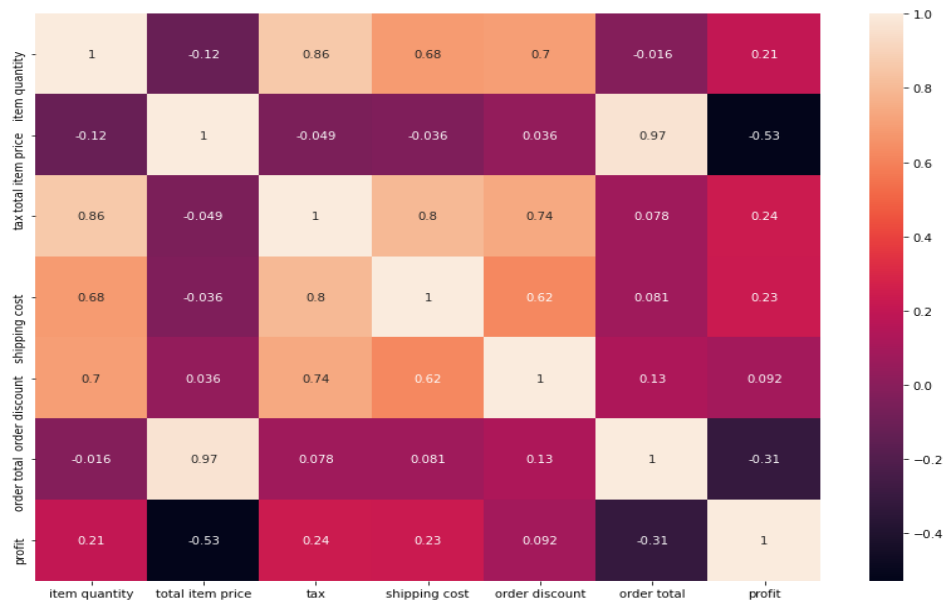


Figure 1

The time series charts (figure 2) are showing a lot of information. We can see that the daily total items purchased, shipping cost, order discount, tax and profit had been consistently increasing until 07/2019, these metrics had a sudden dip, and there was also a deep negative spike in the profit around that time. There was also a positive spike in the discount around 11/2019, 12/2019, the holiday season. Despite the lower daily total items purchased, shipping cost, order discount, tax and profit since 07/2019, the order total has recovered since the second half of 2019, which could indicate the growth of their business is recovering.

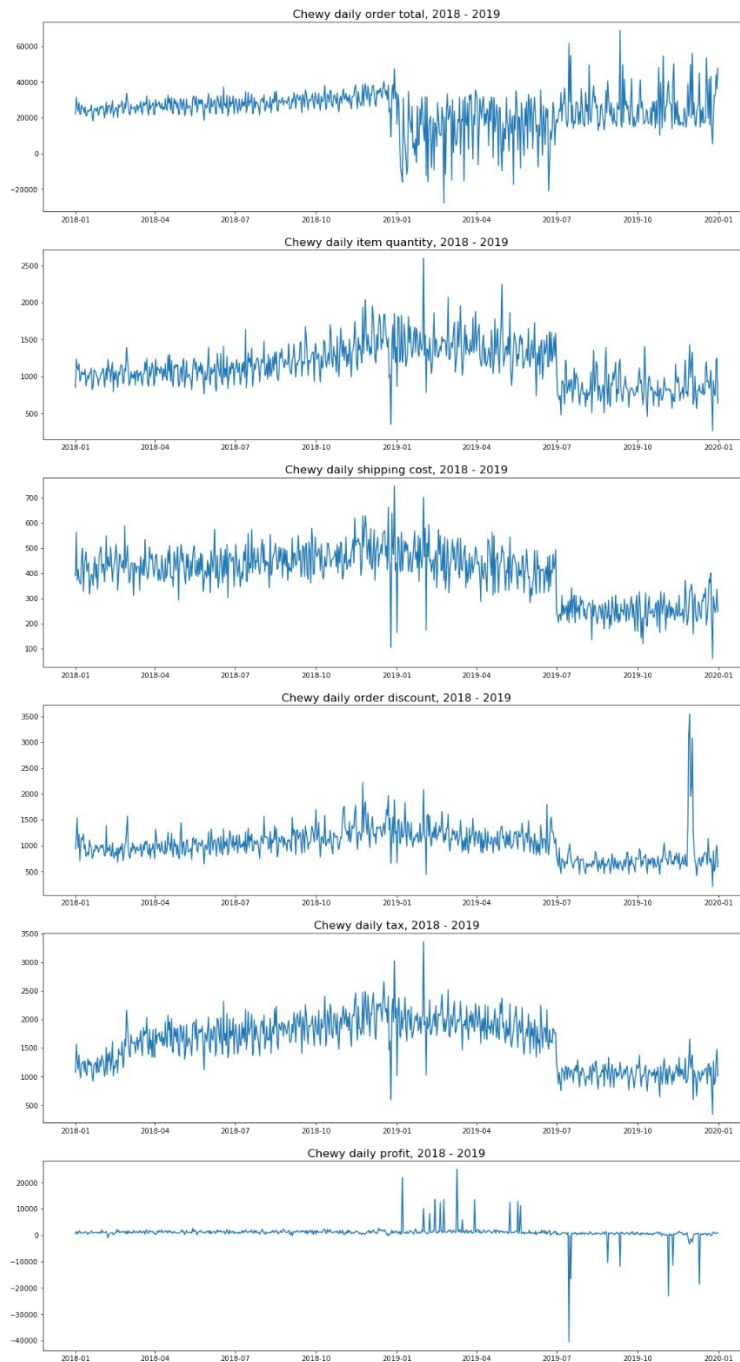


Figure 2

The following bar chart (figure 3) shows the quarterly key performance metrics of Chewy. We can see that the quarterly total items purchased (blue bar) and the quarterly order total (orange bar) had been consistently increasing from 2.26 million dollars (Q1 2018) to 2.89 million dollars (Q4 2018) with an increase of 27.9%, then these metrics had a sudden dip. This dip could be due to broader macroeconomic event happened at the end of 2018, namely the interest rate was raised at the end of 2018. However, we can see the resilience of Chewy's business model, as the quarterly total items purchased (blue bar) and the quarterly order total (orange bar) have been recovering from 1.18 million dollars (Q1 2019) to 2.4 million dollars (Q4 2019) with an increase of 103%, even though the profit margin (green bar) hasn't been fully recovered yet.

quarter	item quantity	total item price (\$)	Tax (\$)	shipping cost (\$)	order discount (\$)	order total (\$)	Profit (\$)	profit margin
2018Q1	92498	1920406	124192	38461.5	85849.11	2262555	93645.96	0.041389
2018Q2	96549	2068090	154460.9	38783.25	91198.37	2461313	108780.3	0.044196
2018Q3	108413	2210969	165983.5	41548.65	101236.9	2630074	110336.6	0.041952
2018Q4	126669	2443720	184635.5	44416.35	118759.6	2897465	105933.6	0.036561
2019Q1	129465	635098.8	177123.8	41045.4	109370.1	1184063	221424.7	0.187004
2019Q2	122419	1043357	166116	37905.12	102184.1	1486494	136931.7	0.092117
2019Q3	78556	2152675	96564.88	23022.45	61552.27	2311730	-22085	-0.00955
2019Q4	78137	2231787	96665.09	23611.5	77478.73	2406172	-23371.1	-0.00971

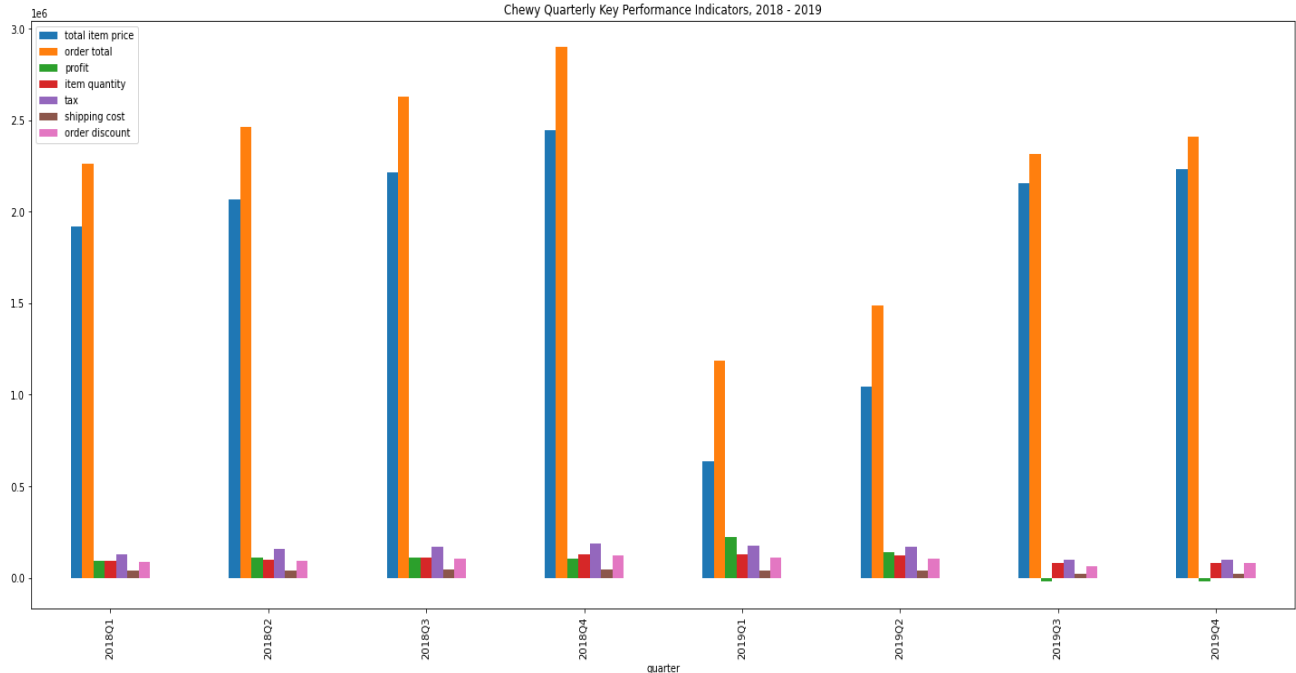


Figure 3

Conclusions and Recommendations

Overall, this analysis shows that Chewy's business has been working very well from Q1 2018 to Q4 2018. The growth had a dip since the end of 2018 possibly due to the broader market conditions, but as the data shows that the growth has been recovering very well since Q1 2019. As figure 4 shows that Chewy's stock has been trading at around \$23 per share near Q4 2019, it is reasonable to believe that this is a good entry point for long term investors, considering the historical strong growth and profit margin, and the resilience of its business model indicated by the recent recovering in growth.



Figure 4