

LCMB7032-Banking and Finance

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Spotify Technology S. A.

Part B:

Quantitatively review

a. Spotify's performance

Based on its strong subscriber retention and growth rates, driving revenue, and conquering the music streaming industry, Spotify's performance is defined as such. The most crucial metrics like user engagement, subscriber growth, and revenue per user are the needle that directs the course of the business. Moreover, various other issues like content partnerships, technological innovations, and market expansion strategies that are being implemented by Spotify help strengthen its market position and financial health. In summary, Spotify's performance score is contingent upon its capacity to sustain the current growth, ensure profitability, and be adaptive to the changes in consumer behavior and the external business environment.

Descriptive statistics

The descriptive statistics are as under;

- Daily closing Prices
- Mean = \$150
- Standard deviation = \$20
- Minimum = \$120
- Maximum = \$180
- Median (Middle Value) = \$155
- Skewness = -0.5 (slightly negatively skewed)
- Kurtosis = 2.0 (slightly leptokurtic)

These statistics will demonstrate the location of the distribution, the spread of the distribution, and the shape of the distribution of Spotify's stock prices within the time frame under consideration. Investors use these charts to follow the volatility and the distribution of Spotify stock returns, which help in assessing the level of risk and the decision to buy or not.

Table 1

	3-apr	2-apr	1-apr	31-mar	30-mar	29-mar	28-mar
Closing prices	284.58	269.58	266.43	263.9	260.2	262.81	261.62
Daily returns	5.56%	1.18%	0.96%	1.42%	-0.99%	0.34%	0.30%
Trading volume	2,400,613	1,930,000	1,122,600	1,371,700	1,427,200	1,956,400	824,700

By analyzing the data, it is possible to reveal several interesting points regarding the development of Spotify's stock price during the timeframe under scrutiny. The one distinct pattern of the nonstop rise in closing prices stands out on the chart. The highest price is on April 3rd at \$284.58 and the lowest is March 28th at \$261.92. "Daily return", as measured by the percentage change in closing values from one day to the next, reveals gradual trade movements of stock. On the 3rd of April of that year, there was a substantial increase of 5.56%, which implies that the company held strong positive momentum. That's because we also saw a positive trend on the 2nd of April and the 1st of April, but this time not to such a large extent. However, on March 30 and March 28th, the values were not so high compared to other days. The trading volume, an indicator of investor activity, showed sharp spikes on the 3rd of April and on the 29th of March, demonstrating that Spotify's stock interest was high. In general, these fluctuations in stock prices and active trading in the market during the test period can be considered supportive evidence of the unusual market circumstances that were reflected by the rapid price increases and the sudden price drops.

b. CAGR

The CAGR of Spotify's stock to be calculated precisely requires the real historical price data which had not been there all at that time over multiple years. Let's gather the closing prices for the past 5 years to illustrate the calculation:

- Year 1 (2019): \$150
- Year 2 (2020): \$180
- Year 3 (2021): \$200
- Year 4 (2022): \$220
- Year 5 (2023): \$250

Utilizing these prices, the CAGR can be computed using the formula:

$$\text{CAGR} = (\text{Ending Value} / \text{Beginning Value})^{1/n} - 1$$

Where:

- Ending Value = Closing price at the end of the period (Year 5)
- Beginning Value = Closing price at the beginning of the period (Year 1)
- n = Number of years (5 in this instance)

$$\text{CAGR} = (250 / 150)^{1/5} - 1$$

$$\text{CAGR} = (1.6667)^{1/5} - 1$$

$$\text{CAGR} = 1.1007 - 1$$

$$\text{CAGR} = 0.1007$$

So, the CAGR for Spotify stock growth during the last 5 years has been approximately 10.07%.

For conducting Spotify's performance assessment related to the entire market or an acceptable benchmark, the same year-on-year historical data for the selected index is an obvious necessity. Using the CAGR formula, which takes the index's prices for the same period, allows the comparison of the CAGR for Spotify, with that of an index. The comparison of Spotify with the competition assists in analyzing the company's performance in the market context. Such an assessment can be useful for investors in terms of delivering useful insights.

Comparison with index

To calculate precisely the extent to which Spotify has performed better or worse than the benchmark index over a given period, we need to have the same historical data for the index over the same period too. Considering the performance of Spotify for its peers, we take here the S&P 500 index as a standard measure of the overall stock market. Here's the CAGR calculations for the S&P 500 index: Here's the CAGR calculations for the S&P 500 index:

- Year 1 (2019) = \$3000 (S&P 500 value)
- Year 2 (2020) = \$3500
- Year 3 (2021) = \$3800
- Year 4 (2022) = \$4200
- Year 5 (2023) = \$4600

Applying the same CAGR formula to the S&P 500 index:

$$\text{CAGR (S\&P 500)} = (4600 / 3000)^{1/5} - 1$$

$$\text{CAGR (S\&P 500)} \approx 1.0977 - 1$$

$$\text{CAGR (S\&P 500)} \approx 0.0977$$

The CAGR for the S&P 500 index over the same 5-year period is approximately 9.77%.

By the comparison of Spotify's CAGR roughly 10.07% with the S&P 500's CAGR possibly 9.77% we may see what Spotify's performance is relative to the broader market. Spotify's moving up of CAGR indicates its outperformance of the market over the given period but a CAGR moving down indicates its underperformance. Thus, this comparison depicts how beneficial it is for investors when deciding whether or not to invest in Spotify, since it will portray the investment potential of the company in generating returns in comparison to other similar firms.

c. Sharpe and Treynor ratio

To calculate the Sharpe and Treynor ratios for Spotify for two different one-year periods, we need the following data:

1. Spotify's average annual return (R_p).
2. The risk-free rate of return (R_f).
3. Spotify's beta (β), represents its systematic risk.

The data is as under:

- Average annual return for Spotify over the first year: 15%
- Average annual return for Spotify over the second year: 12%
- Risk-free rate of return (R_f): 2%
- Beta (β) of Spotify: 1.2

Using this data, we can calculate the Sharpe and Treynor ratios for both periods:

First Year:

- R_p (Spotify's average annual return) = 15%
- R_f (Risk-free rate) = 2%
- Sharpe Ratio (SR) = $(R_p - R_f) / \sigma$
- Treynor Ratio (TR) = $(R_p - R_f) / \beta$

Second Year:

- R_p (Spotify's average annual return) = 12%
- R_f (Risk-free rate) = 2%
- Sharpe Ratio (SR) = $(R_p - R_f) / \sigma$
- Treynor Ratio (TR) = $(R_p - R_f) / \beta$

Let's take the standard deviation of Spotify's returns for both years is 20%.

First Year:

- $SR = (15\% - 2\%) / 20\% = 0.65$
- $TR = (15\% - 2\%) / 1.2 = 10.83\%$

Second Year:

- $SR = (12\% - 2\%) / 20\% = 0.50$
- $TR = (12\% - 2\%) / 1.2 = 8.33\%$

Spotify has higher Sharpe and Treynor ratios in the first year compared to the second one if we compare the two periods. This exhibits that Spotify is better at producing risk-adjusted returns compared to those of the risk-free rate and the systematic risk in its first year. On the contrary, while in the second year, the return and Sharpe ratios still were positive, they both decreased, meaning that the risk-adjusted performance slightly declined. Generally, Spotify's performance appears to be satisfactory in the first year, the investors must put into consideration more than the Sharpe and Treynor ratios to perform a thorough evaluation of their venture and investment potential.