



COVID-19 Affect on the Stock Market

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Introduction: This project will see what affect COVID-19 has had on the stock market by using data from the Nasdaq as shown in Figure 1. Five sectors were chosen: finance, healthcare, energy, technology, and transportation. Confirmed Cases of COVID-19 for the United States is shown in Figure 2. It shows three spikes in confirmed cases that will be used for the analysis.

Analysis: Overall it doesn't seem like COVID-19 had a direct affect on the stock market. On the date of the first confirmed case in the United States the Nasdaq dipped slightly, but had recovered by the end of the month. However, on February 20th, which is before the start of the first spike of cases, the Nasdaq began the crash that is prevalent in Figure 1 for each sector. It then hit its lowest point on March 23rd which is before the first spike of confirmed cases ends. After this low point the market began to increase and for some sectors the average stock price is higher than before the first confirmed case of COVID-19.

Analysis: Table 1 shows that from the start of the first spike to the peak there was a significant drop in the average price across all sectors. This time frame coincides with the crash seen in figure 1. The second spike doesn't seem to have any significant change. The third spike has an increase from the start to the peak.

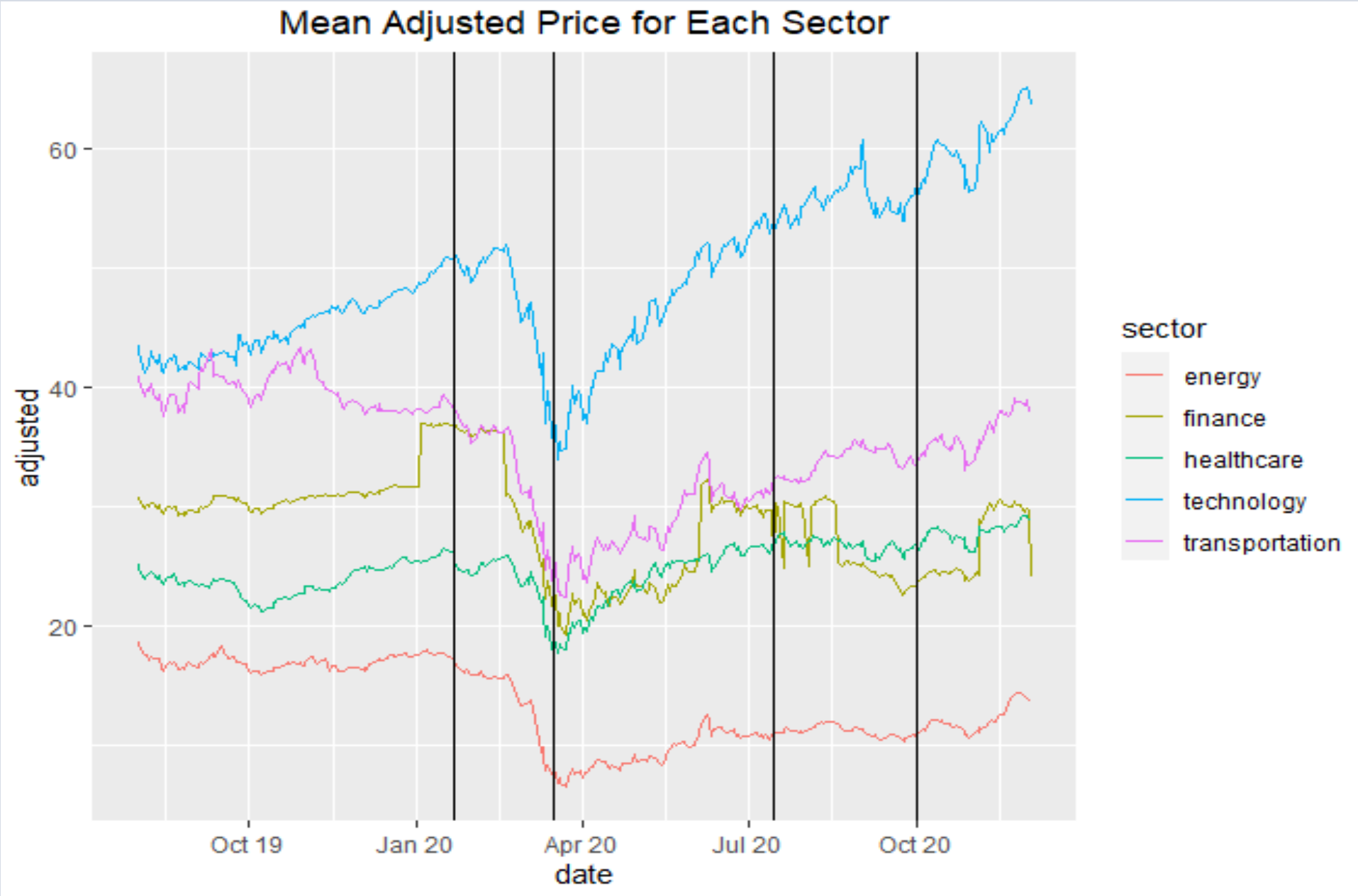


Figure 1: Overall trend of the NASDAQ for the selected sectors

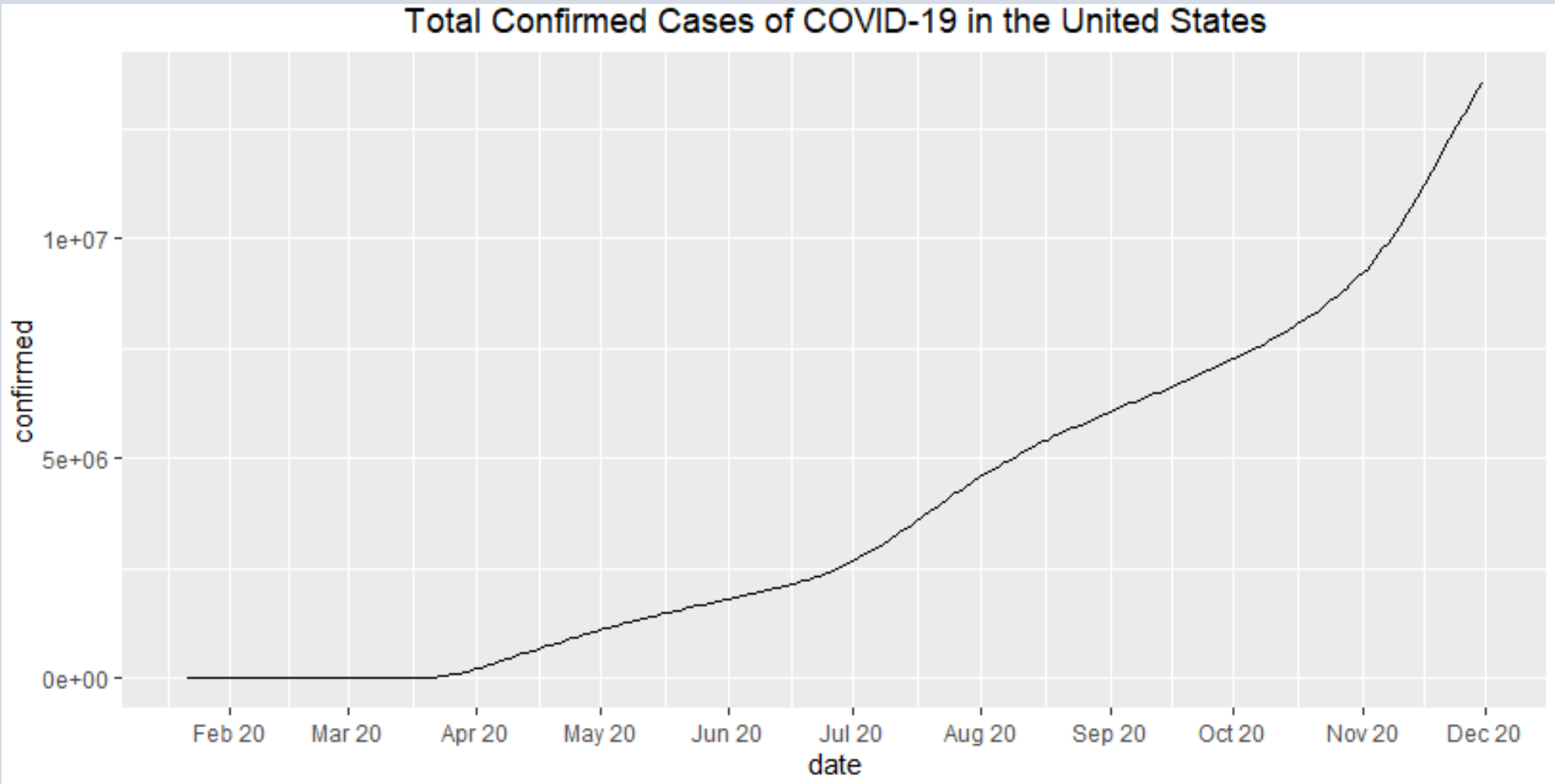


Figure 2: Confirmed Cases of COVID-19 for the United States

Table 1: Spike 1 Average Adjusted Price

Sector	Beginning Average	End Average	Difference	Standard Deviation
Energy	7.37	8.28	0.91	2.02
Finance	21.26	21.72	0.46	2.54
Health	17.57	20.72	3.15	1.93
Tech	34.79	40.04	5.25	3.56
Transport	23.18	25.59	2.41	2.37

Table 2: Spike 2 Average Adjusted Price

Sector	Beginning Average	End Average	Difference	Standard Deviation
Energy	11.36	11.07	-0.29	0.48
Finance	29.94	30.24	0.30	1.91
Health	24.89	26.94	2.05	0.70
Tech	49.75	53.35	3.6	1.59
Transport	31.25	32.41	1.16	1.03

Table 3: Spike 3 Average Adjusted Price

Sector	Beginning Average	End Average	Difference	Standard Deviation
Energy	11.36	11.07	-0.29	0.48
Finance	29.94	30.24	0.30	1.91
Health	24.89	26.94	2.05	0.70
Tech	49.75	53.35	3.6	1.59
Transport	31.25	32.41	1.16	1.03

Conclusion: The stock market is volatile and there are many factors that can affect a stock price. COVID-19 does not seem to have a direct impact on the stock market as the analysis of the second and third spike in cases show. During those two spikes the stock market continued to trend upward and is still doing so. The drop in the stock market in March coincided with the government shutdown that was caused by the spread of COVID-19.

- Goals:**
- Analyze all main sectors
 - Analyze individual sectors
 - Look for a difference in patterns between each sector
 - Repeated Measures Analysis of Variance

References:

1. COVID19 R library for COVID-19 data
2. tidyquant R library for Nasdaq stock prices