Coca Cola Stock Analysis

This analysis investigates Coca-Cola's stock performance from 2019 to 2023 using key statistical measures, time series visualizations, and predictive modeling. The study highlights trends, short-term fluctuations, and long-term growth patterns, providing actionable insights for investors. Advanced tools like ARIMA forecasting and moving averages are employed to offer a comprehensive understanding of stock behavior.

```
setwd("/Users/bahaarahuja/Desktop")
getwd()
```

```
## [1] "/Users/bahaarahuja/Desktop"
```

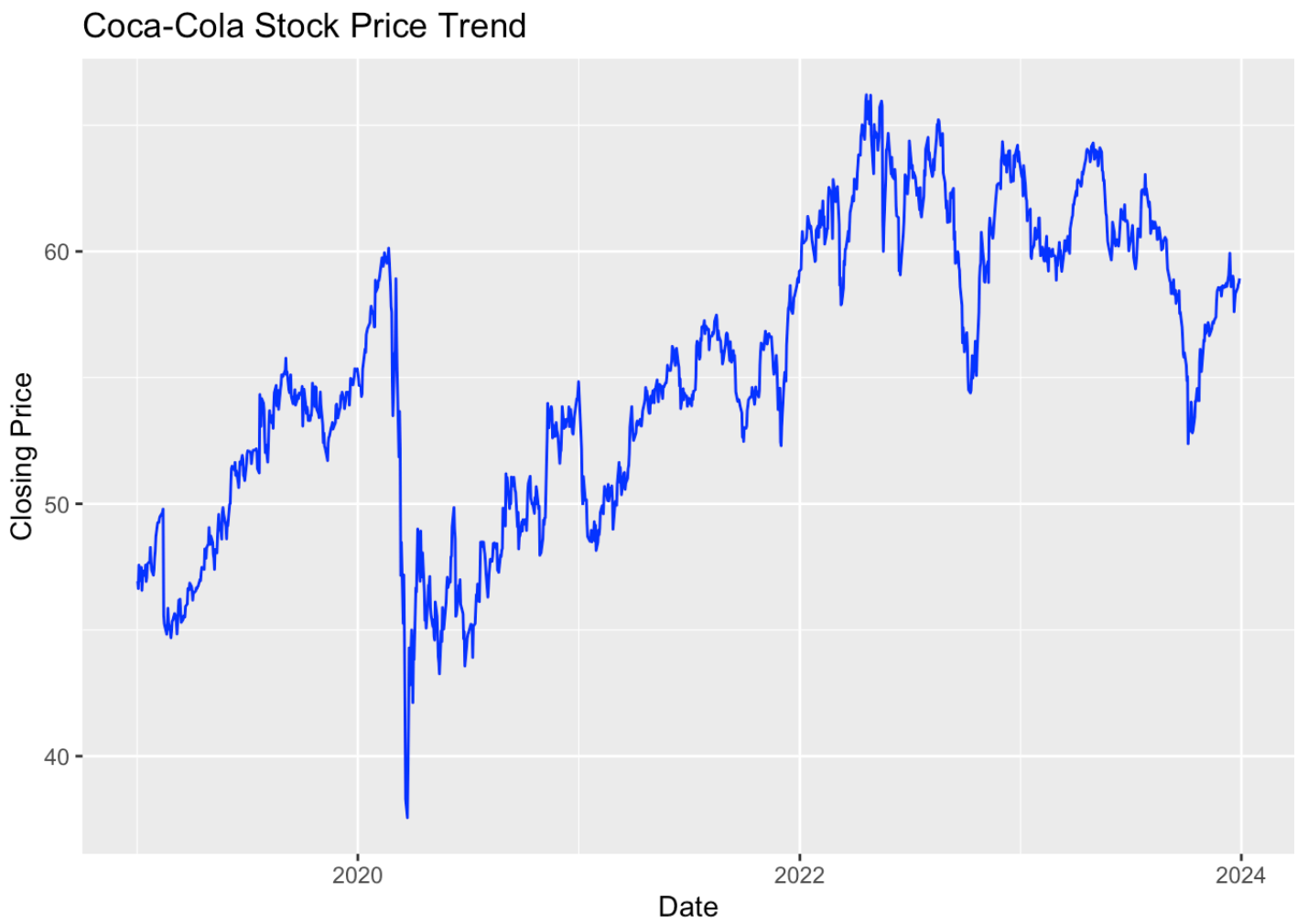
```
data <- read.csv("Coca Cola.csv", stringsAsFactors = FALSE)
data$Date <- as.Date(data$Date, format = "%Y-%m-%d")
glimpse(data)
```

```
## Rows: 1,258
## Columns: 7
## $ Date      <date> 2019-01-02, 2019-01-03, 2019-01-04, 2019-01-07, 2019-01-08,…
## $ Open      <dbl> 46.94, 46.82, 46.75, 47.57, 47.25, 47.08, 46.66, 47.29, 47.2…
## $ High      <dbl> 47.22, 47.37, 47.57, 47.75, 47.57, 47.28, 47.09, 47.36, 47.4…
## $ Low       <dbl> 46.56, 46.53, 46.64, 46.90, 47.04, 46.43, 46.34, 46.97, 46.9…
## $ Close     <dbl> 46.93, 46.64, 47.57, 46.95, 47.48, 46.57, 47.07, 47.34, 47.1…
## $ Adj.Close <dbl> 39.82879, 39.58267, 40.37195, 39.84577, 40.29557, 39.52326, …
## $ Volume    <int> 11603700, 14714400, 13013700, 13135500, 15420700, 18032500, …
```

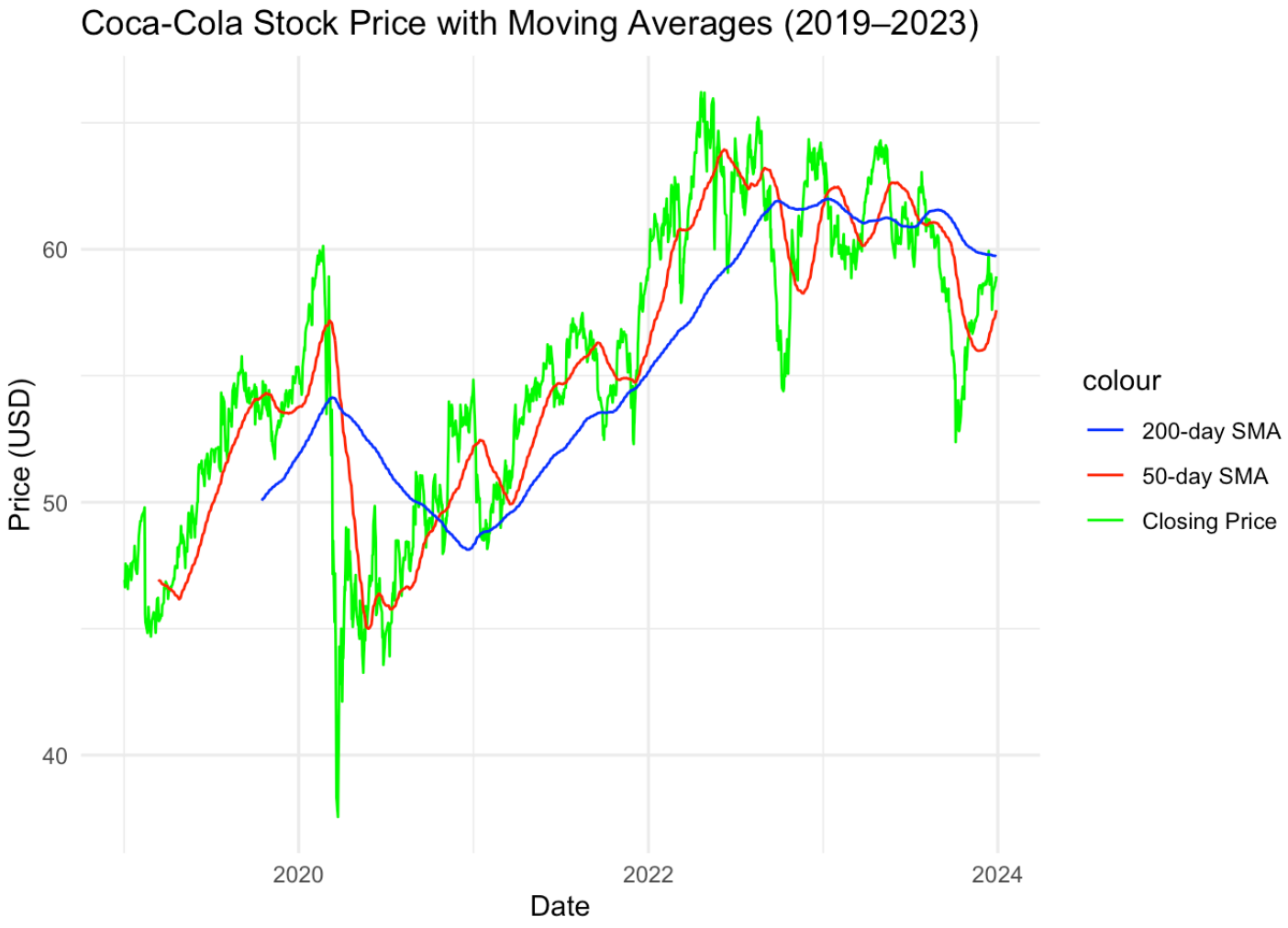
```
summary(data)
```

```
##       Date                 Open             High             Low        
##  Min.   :2019-01-02   Min.   :38.76   Min.   :38.89   Min.   :36.27  
##  1st Qu.:2020-04-01   1st Qu.:50.98   1st Qu.:51.31   1st Qu.:50.47  
##  Median :2021-06-30   Median :55.01   Median :55.37   Median :54.76  
##  Mean   :2021-06-30   Mean   :55.28   Mean   :55.69   Mean   :54.85  
##  3rd Qu.:2022-09-28   3rd Qu.:60.20   3rd Qu.:60.63   3rd Qu.:59.75  
##  Max.   :2023-12-29   Max.   :67.00   Max.   :67.20   Max.   :65.72  
##      Close          Adj.Close          Volume        
##  Min.   :37.56   Min.   :33.18   Min.   : 3265500  
##  1st Qu.:50.86   1st Qu.:45.06   1st Qu.:10944725  
##  Median :55.02   Median :50.47   Median :13660250  
##  Mean   :55.27   Mean   :50.89   Mean   :15094189  
##  3rd Qu.:60.23   3rd Qu.:57.79   3rd Qu.:17170575  
##  Max.   :66.21   Max.   :62.32   Max.   :67845700
```

Observations- Stock prices exhibit a mean closing price of $55.27 and a maximum of $66.21.Volume fluctuates significantly, ranging from 3.26 million to 67.84 million shares.

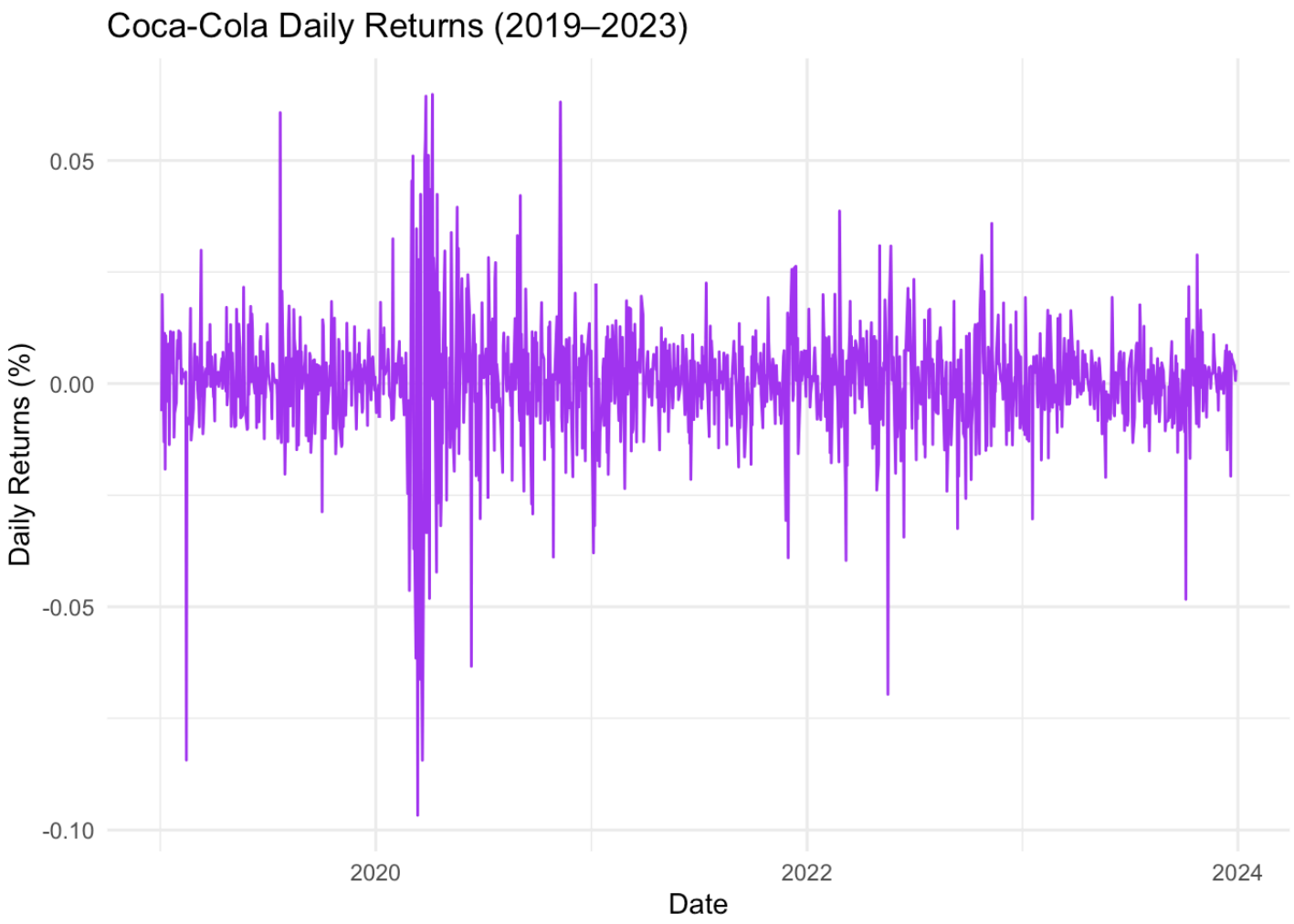


```
# Calculate SMAs
data$SMA_50 <- SMA(data$Close, n = 50)
data$SMA_200 <- SMA(data$Close, n = 200)

# Plot moving averages
ggplot(data, aes(x = Date)) +
  geom_line(aes(y = Close, color = "Closing Price"), na.rm = TRUE) +
  geom_line(aes(y = SMA_50, color = "50-day SMA"), na.rm = TRUE) +
  geom_line(aes(y = SMA_200, color = "200-day SMA"), na.rm = TRUE) +
  labs(
    title = "Coca-Cola Stock Price with Moving Averages (2019–2023)",
    x = "Date",
    y = "Price (USD)"
  ) +
  scale_color_manual(values = c("blue", "red", "green")) +
  theme_minimal()
```



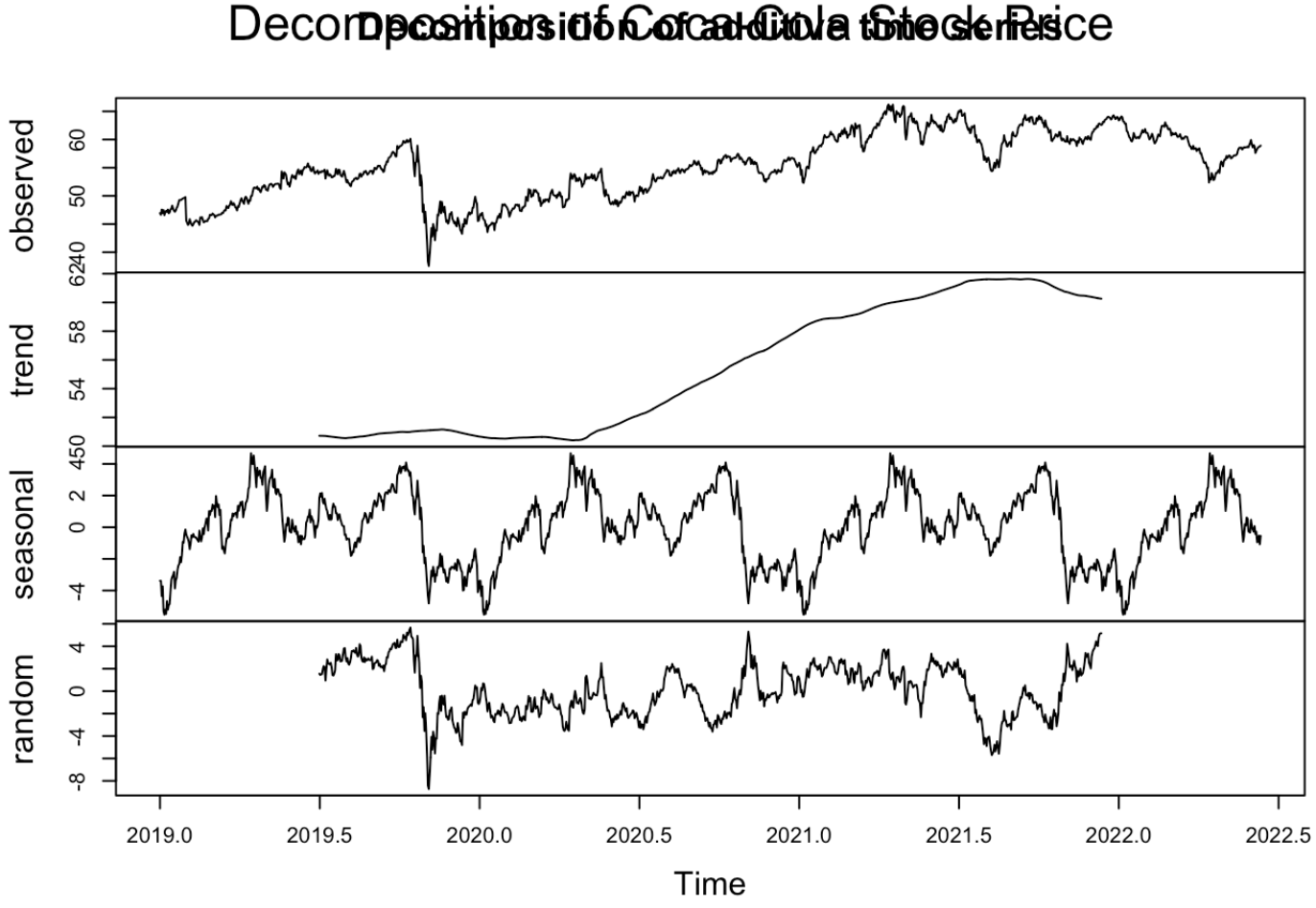
The graph shows Coca-Cola's stock price along with 50-day and 200-day Simple Moving Averages (SMA) from 2019 to 2023 The stock price (blue line) shows overall growth with some volatility. A 22% drop occurred in early 2020 during the COVID-19 pandemic, reflecting market turbulence. The 50-day SMA tracks short-term price trends, while the 200-day SMA shows long-term stability.

```
# Calculate daily returns
data <- data %>%
  mutate(Daily_Return = c(NA, diff(Close) / head(Close, -1)))

# Plot daily returns
ggplot(data, aes(x = Date, y = Daily_Return)) +
  geom_line(color = "purple", na.rm = TRUE) +
  labs(
    title = "Coca-Cola Daily Returns (2019–2023)",
    x = "Date",
    y = "Daily Returns (%)"
  ) +
  theme_minimal()
```



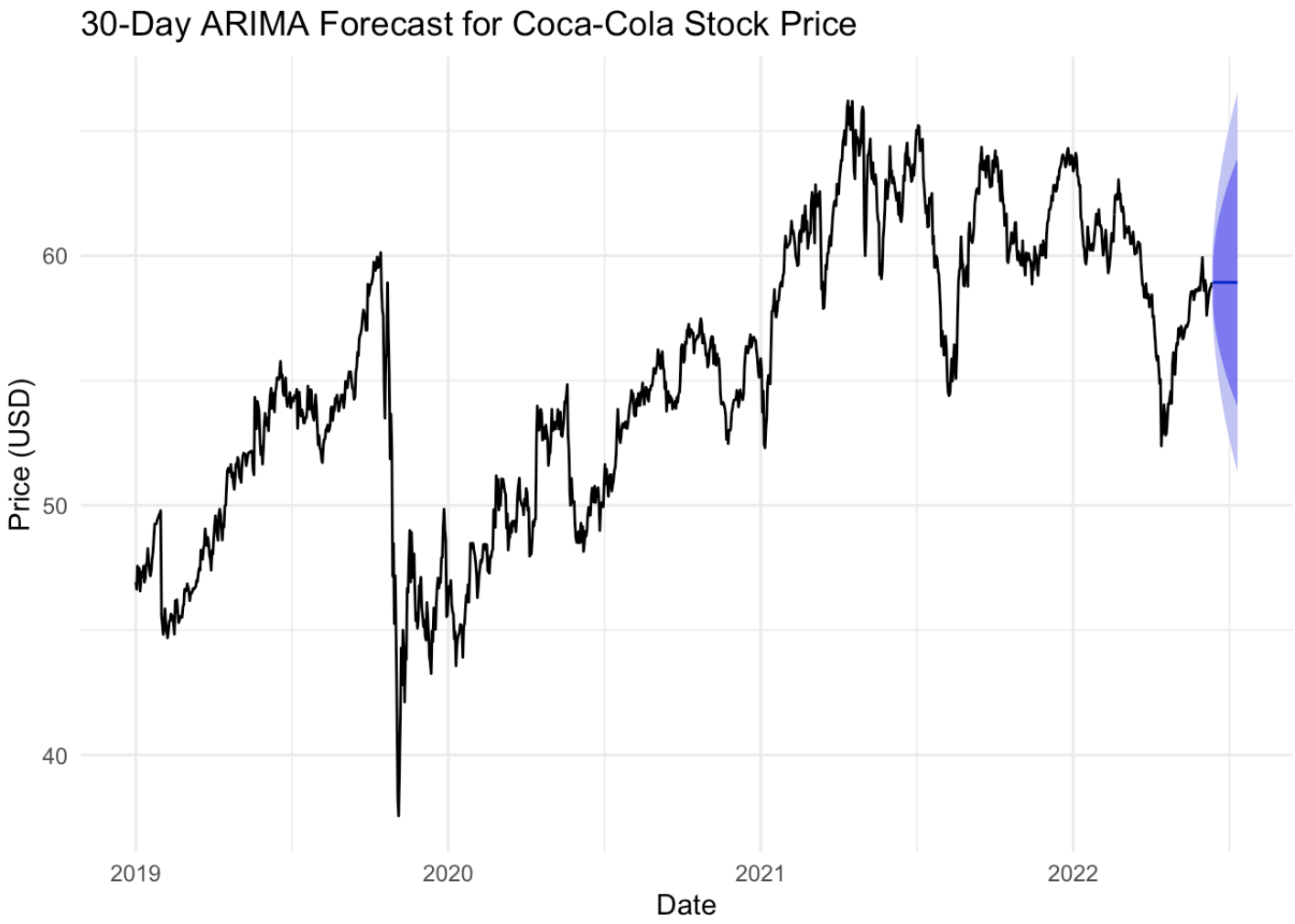
This graph displays Coca-Cola's daily stock returns- Daily returns fluctuate around 0%, with a volatility spike of 7% in early 2020. The spike in volatility in early 2020 corresponds to the pandemic-related market turbulence. Recent years show reduced volatility, with an average daily return of 0.1%.

```
stock_ts <- ts(data$Close, start = c(2019, 1), frequency = 365)
decomposed <- decompose(stock_ts)

plot(decomposed)

mtext("Decomposition of Coca-Cola Stock Price", side = 3, line = -2, outer = TRUE, ce
x = 1.5)
```



This graph shows the decomposition of Coca-Cola's stock price into trend, seasonal, and random components- The trend component reveals a clear upward trajectory, indicating long-term growth. The seasonal component shows regular patterns, possibly related to quarterly earnings reports or annual cycles. The random component highlights short-term fluctuations that don't fit the trend or seasonal patterns

```
arima_model <- auto.arima(stock_ts)
forecasted <- forecast(arima_model, h = 30)  # Forecast for the next 30 days
autoplot(forecasted) +
  labs(
    title = "30-Day ARIMA Forecast for Coca-Cola Stock Price",
    x = "Date",
    y = "Price (USD)"
  ) +
  theme_minimal()
```



The final graph presents an ARIMA model forecast for Coca-Cola's stock price. It predicts a 2.5% growth in the next 30 days. The historical data (black line) shows the actual stock price leading up to the forecast period. The widening shaded areas represent increasing uncertainty in the prediction over time.

Key Takeaways:- Coca-Cola's stock demonstrates a steady upward trajectory, making it an attractive option for long-term investors. Reduced daily return volatility in recent years indicates a potentially lower risk profile. Seasonal patterns should be leveraged for investment timing. ARIMA forecasting highlights the stock's growth potential, though uncertainty increases over time.