A red text on a white background

Description automatically generated

![ netflix\_white\_background](https://github.com/k1bray/stock-price-analysis/blob/main/Visuals/netflix\_white\_background.jpg)

**# Introduction**

Netflix began as an idea in 1997 by Reed Hastings and Marc Randolph that would give consumers the ability to rent DVDs through the mail via a website instead of having to go to a store. Their website and business officially launched in 1998 with their subscription service coming soon after in 1999 that offered unlimited DVD rentals without due dates, late fees, or monthly rental limits. The company was brought public on May 23, 2002, with an initial public offering (IPO) on NASDAQ for the ticker symbol: NFLX. Innovative features to the user experience over the years, such as a personalized movie recommendation system based on customer’s movie ratings, and successfully transitioning the company’s focus to streaming services has helped to bolster revenue as well as the stock price to its current level.

**### Disclaimer**

Under no circumstances should this report, or any information contained therein, be viewed as financial advice. Any opinions expressed within are in no way representative of any person or business other than the original creator and any entities under their direct ownership and/or control.

**# Table of Contents**

[Summary of Project Intention]

[Dataset Examination and Profiling]

[Cleaning and Manipulation of Data]

[Analysis and Discussion]

[Recommendations and Possible Further Actions Based on Analysis]

**# Summary of Project Intention**

The intended purpose of this project is to take a closer look at the traded price performance of Netflix (NFLX) since its IPO in May of 2002 through April of 2024. This was done by calculating various metrics that utilize the available objective data. A comparison was made to the performance of the overall market during the same period by using the Select Sector SPDRs ETF that tracks the S&P500 (ticker symbol: SPY).

**### Tools Used for Analysis**

There were multiple tools used in the process of this analysis. A server was created on a local device that was facilitated through Microsoft SQL Server and manipulated through VSCode. Microsoft Excel was used to view financial statements from NFLX. Microsoft Word was used as the main platform for writing the report of the analysis. Tableau Public Desktop and Microsoft Excel were used to create the visuals.

**# Dataset Examination and Profiling**

**### Data Availability and License**

The NFLX data can be accessed [[here]](https://www.kaggle.com/datasets/mayankanand2701/netflix-stock-price-dataset) and the dataset license can be viewed [[here]](https://www.mit.edu/~amini/LICENSE.md)

The SPY data can be accessed [[here]](https://www.kaggle.com/datasets/gkitchen/s-and-p-500-spy) and the dataset license can be viewed [[here]](https://www.apache.org/licenses/LICENSE-2.0)

Both tables used in this analysis had a similar format and consisted of quantitative, structed data with columns showing daily trading data for Date, Open, High, Low, Close, and Volume. The SPY table contained additional columns parsing out the date components but were not used for the purposes of this project.

The SQL code that was used during all phases of this project can be seen [here]

The schemas were checked for both tables and it was found that during the import process the datatypes for all columns in the NFLX table were set by default to varchar (50) and were adjusted accordingly. The columns in the SPY table were imported using the proper datatypes and did not require any adjustment.

While calculating descriptive statistics of both tables it was verified that they were properly limited to the same start and end dates, as well as the same number of rows. Thereby ensuring the accuracy of the data being used for the sake of performance comparison.

Both tables were checked for any NULL values, and none were found.

Both tables were checked for duplicate rows based on the ‘Date’ column, and none were found.

**# Cleaning and Manipulation of Data**

The name of the NFLX table was changed from ‘nflx\_stock\_price’ to simply ‘nflx’ to match the naming convention of the ‘spy’ table as well as to ease query writing.

The columns in the NFLX table schema were adjusted to their proper datatypes.

The ‘Adj Close’ column in the NFLX table was found to be identical with the ‘Close’ column and was removed from the table.

The extra date-related columns in the SPY table were removed.

**# Analysis and Discussion**

The dates included in the comparison analysis were standardized to ensure that the same period was being considered for each table. Specifically, between May 23, 2002 (the IPO for NFLX), and April 30, 2024 (the limit of the dataset available for SPY).

Some general exploratory data analysis was done by calculating summary statistics. Both tables were examined while finding values for the averages of opening and closing prices over the trading life of NFLX, as well as the minimum and maximum values of highs and lows. However, given the range of values that NFLX has held since its IPO as well as the amount of time that has passed since, the application of those calculations is limited to an exercise for the analytical theory that frames this report.

**### The 30-, 50-, and 200-day simple moving averages were calculated.**

![nflx\_vs\_spy\_sma]( https://github.com/k1bray/stock-price-analysis/blob/main/Visuals/nflx\_vs\_spy\_sma.png)

A trader/investor can utilize a simple moving average (SMA) to make various decisions or determinations about an individual tradeable product, or even the overall market. Moving averages of various time periods can be used to determine or verify trends, or potential changes in trends. In very general terms, the trend is bullish if the values of the moving average are increasing while the traded values of the stock are higher than the moving average values, and bearish if the opposite is true. However, as will be explained below, the length of the moving average period can be adjusted and needs to be considered within the appropriate context of the trading/investing goals and outlook held by the individual.

Simple moving averages can be used to determine levels of support and resistance for technical analysis of stock charts. Stock trading values tend to “bounce” off SMA lines and act as either lower support in a bullish trend or upper resistance in a bearish trend.

When multiple moving averages of different time frames are utilized, they can act as potential indicators for buy or sell signals in relation to changes in trend or price change momentum. When a shorter-term SMA crosses above a longer-term SMA, this could be interpreted as a buy signal, or what is called a “Golden Cross”. Conversely, a shorter-term SMA crossing below a longer-term SMA could be a sell signal, or what is referred to as a “Death Cross”. This concept could also be applied to a situation where a trader wants to incorporate a stop-loss strategy. This can be done on many modern trading platforms where a sell order could be triggered by a set of conditions being met, such as a short-term SMA crossing below a longer-term SMA.

Moving averages of different time periods can be useful in different types of trading. For example, using a 20- and 30-day SMA together can be useful for short-term swing trading, while a 50- and 200-day SMA can be used together for more longer-term trading.

Since no single indicator should be used in technical analysis as the sole basis for either a buy or sell signal, moving averages can often act as confirmation signals when used in conjunction with other technical indicators.

**### The running historical volatility was calculated using a 30-day timeframe.**

![nflx\_vs\_spy\_hv]( https://github.com/k1bray/stock-price-analysis/blob/main/Visuals/nflx\_vs\_spy\_hv.png)

Historical volatility (HV) is a measure of the extent to which the price of an asset has fluctuated over a given time period ([Investopedia.com](https://www.investopedia.com/terms/h/historicalvolatility.asp#:~:text=Historical%20volatility%20%28HV%29%20is%20a%20statistical%20measure%20of,a%20financial%20instrument%20in%20the%20given%20time%20period.)).

The HV value is significant to trading and investing for several different reasons. One way that it can be used is to assess the potential risk of an individual asset. An asset with a higher HV value would be one that has historically shown a potential for higher price swings, which some traders/investors might view as having higher risk. Conversely, an asset that has historically experienced smaller price swings would have a lower HV value and could be interpreted as having a lower risk level. However, it should also be noted that some tradeable products will show swings in volatility as well as price. Some stocks enter periods of lower HV that can precede a significant price move in reaction to a binary event, such as leading up to a corporate announcement before releasing an earnings report, announcement of an anticipated product launch, anticipated macroeconomic policy events, or FDA drug approval. It should also be noted that the qualification of the concept of a security being considered either high or low risk is perspective-dependent and tied closely to the intentions and viewpoints of the individual investor/trader. Different levels of perceived risk are appropriate for different types of trading/investing. Stocks with higher HV can be attractive to short-term swing and day traders, while stocks with lower HV can be attractive to more conservative traders with a longer-term investment horizon. In this way, HV values for a particular stock, or the overall market, can help traders/investors make informed decisions regarding strategy and outlook.

HV, as a backward-looking metric of volatility, is different from Implied Volatility (IV) which is a forward-looking metric of volatility. IV is used in the pricing of option contracts on equities and indices ([Investopedia.com](https://www.investopedia.com/ask/answers/032515/what-options-implied-volatility-and-how-it-calculated.asp)). However, the two can be compared to try and find instances of potential mispricing of options, which may be considered undervalued when HV is higher than IV and overvalued when the opposite is true.

**### How often in a given timeframe does NFLX trade within 1 STD?**

Since IPO = 81.4% of trading days

6 months = 76.9% of trading days

12 months = 77.9% of trading days

24 months = 79.6% of trading days

36 months = 83.2% of trading days

48 months = 81.9% of trading days

Even though NFLX doesn’t pay a quarterly or annual dividend, it still might be considered a good candidate as a buy-and-hold investment. Without considering the business fundamentals, the numbers above are indicative of a stock that is relatively stable. In all time periods considered, the daily mean returns were positive figures. This means that NFLX has shown a sustained upward bias to its trend. Also, the percentage of days that NFLX traded within 1 STD for each period shows a stock that is consistently more stable given an expected normal distribution of 68%.

**### How often in a given timeframe does SPY trade within 1 STD?**

Since NFLX IPO = 80.1% of trading days

6 months = 66.7% of trading days

12 months = 68.6% of trading days

24 months = 71.9% of trading days

36 months = 71.9% of trading days

48 months = 72.7% of trading days

With a ‘normal’ distribution of having roughly 68% of daily price moves falling within 1 STD of the mean, the figures above with an average of 71.98% are generally closer when compared to NFLX with an average of 80.15%. Although these figures suggest that the overall market is potentially a relatively stable investment, NFLX could be even more so.

**### Calculating Annual Returns**

The yearly percentage return was calculated for each year since the NFLX IPO. A point to note is that both the years 2002 and 2024 returns were based on incomplete periods.

![ nflx\_vs\_spy\_annual\_pct\_return]( https://github.com/k1bray/stock-price-analysis/blob/main/Visuals/nflx\_vs\_spy\_annual\_pct\_return.png)

As can be seen in the chart above, when compared to the first half of its trading life, the past 10 years have shown more stability in the annual percentage returns for NFLX.

Over the publicly traded lifetime of NFLX, the annual percentage returns for SPY are generally lower. However, with a few years being exceptions, it has offered overall more stable investment returns during the same period. This helps reinforce the generally accepted notion of the overall market being a “safe” place to park invested funds.

**### Hypothetical Investment**

To assess the historical long-term performance of NFLX stock, the potential return was analyzed using a hypothetical $100 investment made on the IPO date, May 23, 2002.

The results showed that a $100 investment in NFLX on May 23, 2002, would be worth approximately $54,056.70 as of April 30, 2024 (split adjusted), representing a significant gain of over 53,957%. This demonstrates the substantial long-term growth of NFLX stock over the past 22 years.

The same calculations were made using data from SPY as well as the same starting date of May 23, 2002, and a hypothetical investment of $100 and was found to be worth $690.30 as of April 30, 2024. This represents a 590% appreciation in value.

**## Analysis of NFLX Financials**

NFLX Q1 2024 financial statements can be seen [here](https://ir.netflix.net/financials/financial-statements/default.aspx).

Note: All values are in thousands of dollars unless otherwise indicated.

**Qualitative Factors**

**Innovation and Content** - The ability to produce and acquire compelling content.

**Management Quality** - Track record and strategic vision of the management team.

**# Recommendations and Possible Further Actions Based on Analysis**

Is NFLX a “buy”?

It's important to note that past performance is not indicative of future results. NFLX has seen a historic rise in value that most likely will not be repeated any time soon to an identical degree barring a drastic shift in market conditions and a massive show of business flexibility on behalf of the company’s management to efficiently and effectively leverage new and existing revenue streams.